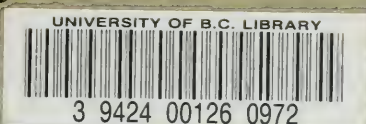


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Royal Horticultural Society.



BULBOUS IRISES.

BY

PROF. MICHAEL FOSTER, SEC.R.S. F.R.H.S. &c.

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BULBOUS IRISES.

By Professor M. FOSTER, F.R.S.

[A Lecture delivered May 3, 1892.]

[The following contains the substance of the lecture as given, though I have somewhat expanded and variously modified what I actually said; and I have added a detailed description of the several species.

I am much indebted to the editors of the *Gardeners' Chronicle* and of the *Garden* for the loan of woodcuts; the source is indicated in each figure. Those figures which bear the name "Caparn" were most kindly drawn for me by my friend Mr. J. W. Caparn, of Oundle. The rest were prepared for me by Mr. Wilson, of Cambridge. Unless otherwise stated, the figures are of natural size.]

I PROPOSE to treat my subject as much as possible from a gardener's point of view, and shall therefore not take up more time than is necessary with botanical details. To start with, I use the term "bulbous" in the gardener's, not in the botanist's meaning. We gardeners are regarded, and indeed justly regarded, by the botanists as being very loose in our use of the word "bulb"; we often include as bulbs what ought to be called "corms," "tubers," or the like. I do not propose to discuss to-day which Irises form "true" bulbs, and shall use the term "bulb" in the loose gardening sense. If a gardening definition of a bulb be wanted, we may perhaps say that "it is a specially fed bud which separates of its own accord from the mother stock in order to live an independent existence."

Iris Sisyrinchium.

Let me begin by calling your attention to a little bulbous Iris which is perhaps the most widespread, geographically speaking, of the whole genus, and at the same time probably one of the oldest Irises in existence, retaining the archaic features of the stock from which many other Irises have

descended. This is *Iris Sisyrinchium* (figs. 1 and 2), which may be traced from Spain, Portugal, and Morocco on the extreme west of Europe, through Algiers, Sicily, Corsica, South Italy, Greece, Egypt, Palestine, Asia Minor, Persia, and Beloochistan to Afghanistan and the Punjaub in the east.

The bulb, small and globose—that is to say, a flattened sphere—may be readily recognised by its shaggy coats, several of which



FIG. 1.—*IRIS SISYRINCHIUM* (reduced one-fourth).

may be peeled off from an old bulb. Hence the name; for the Greek word *sisyra* (σισύρα) means a shaggy goat skin. From between two very narrow channelled curving leaves springs a slender stem, half a foot or a foot, or even more in height; this bears at its summit, and sometimes on laterals, a tuft of small, purple, but variously marked, often fragrant flowers. Each flower is very fugitive; it does not last even a day. Opening in the late forenoon, it closes and withers in the afternoon, so that the owner who is away all day never sees it; but, to atone for this, many blooms open in succes-

sion. It varies much in stature, and in the colour and marking of the flowers. One of the most distinct varieties is the *Iris maricoides* of Regel, which I feel unable to sever from the rest as a true species. Another is the *I. monophylla* of Boissier and Heldreich, which has one leaf only, frequently one flower only, and a stem a few inches high. Considering, however, the wide geographical distribution of the species, it is to be wondered that it does not vary more.

In one point of intimate structure—namely, the coalescence of the filaments of the stamens in their lower parts with each other and with the styles—it shows its affinity to some of the South African Irids, for instance, to the genus *Moræa*; and, indeed, by some authors the plant is spoken of as a *Moræa*, and not as an *Iris*. But I will not dwell on this, except to say that the amount of coalescence is variable.

As a rule, this *Iris* does not do well in this country. In all its natural habitats it is sent to rest after flowering, being dried and baked by the heat of a dry, hot, rainless summer; this it does not naturally meet with in our land. And, though it is a pretty little thing, it hardly repays the efforts necessary to give it artificially such a summer. Whenever I have been able to get information as to the soil in which it lives at home, that soil has been, in nearly all cases, not “peaty sand,” but a stiff clay, baked to a hard brick in summer. And though I cannot pretend to have had much success in cultivating it, it has seemed to me happiest when grown in the stiffest soil at my command. Probably in most places in this country the best plan would be to take the bulbs up after flowering, and replant in autumn. In any case it needs the hottest, sunniest spot.



FIG. 2.—*IRIS SISYRINCHIUM*.

The Reticulata Group.

I have suggested that *I. Sisyrinchium* is a very ancient primitive bulbous *Iris*, a bulbous *Iris* which still retains many

of the characters of the bulbous Irises of long ago. And we may fairly suppose that from it has descended the more specialised form now so well known as *I. reticulata* (fig. 3). This receives its name from the netted nature of the coats of the bulb* (figs. 4 and 5). *I. Sisyrinchium* has also netted coats, but the coats of *I. reticulata* are fewer and thinner than those of *I. Sisyrinchium*, never forming a shaggy envelope, and the pattern of the network is different. The form of the *reticulata* bulb is, moreover, an oval, sometimes a long oval, not a flattened



FIG. 3.—IRIS RETICULATA.
(From the Garden.)



FIG. 4.—BULB OF IRIS RETICULATA
(Caparn).



x5

FIG. 5.—PORTION OF THE OUTER
COAT OF A RETICULATA BULB,
magnified five times.

sphere as in *Sisyrinchium*, so that there is no difficulty in distinguishing the bulbs.

I have used the phrase *Iris reticulata* as if there were a single species only; but we now know several allied Irises, and the number will probably be still enlarged, forming together what may be called "the *reticulata* group."

* The netted character is more marked in the outer older coats than in the inner newer ones, so that if the outer coats be removed it is not so easy to recognise that the coats are netted. This is more particularly so with some of the species of the group—e.g. *I. Danfordiæ* and *I. Kolpakowskiana*, in which the inner coats show hardly any netting at all.

What is generally considered as the typical *I. reticulata* is a familiar and beloved plant. Nearly all gardeners know its beautiful deep violet fragrant flowers, with the long narrow fall* stretched out nearly on the level, and bearing just in front of the stigma a bright golden or orange patch, which, forming a charming contrast to the deep violet of the rest of the blade, serves as a "signal" for the insects, showing them the mouth of the path which leads to the nectar at the stamen's base. Also well known is the less handsome form known as the variety *Krelagei*, with its broader segments and more purple, not unfrequently dull-coloured flowers, which, moreover, are rarely fragrant. The former is called the type, because it is the one which was first described, namely, by Marschal von Bieberstein, early in this century (having been discovered, Sweet says, by Adams, who sent the plant to Bieberstein), whereas the variety *Krelagei* was not described (and then by Regel) until long afterwards. But in the native country of the two, the south-eastern regions of the Caucasus, the variety *Krelagei* is not only much more variable, but also far more abundant than the type. The variety *Krelagei* is abundant in the neighbourhood of Tiflis, and all the specimens of imported bulbs during the last few years which have come into my hands have been of this variety; so far I have not come across any specimen of the type brought direct from its native habitat. Moreover, seedlings of the type turn out in many cases to have all the characters of the variety

* I use the familiar term "fall" instead of "outer perianth segment" or "sepal," and in like manner "standard" instead of "inner perianth segment" or "petal." Each consists of a terminal "blade," usually expanded, and attached to the rest of the flower by a "claw" or "haft," which is usually narrower than the blade, and in the case of the fall frequently marked off from it by a constriction. The three parts forming the centre of the flower are sometimes called "petaloid stigmas"; each consists of a body overhanging the stamen, united at the base with its fellows into a column, and ending above in two triangular, quadrate, or otherwise shaped "crests" of variable size. Immediately below the crests is a horizontal ledge of variable size and form projecting towards the blade of the fall, and so arranged that an insect brushes against the upper surface as it crawls into the sort of tunnel formed by the body of the style above and the claw of the fall below. It is this upper surface, and this only, which is the true stigma, and on which the insect visiting the flower deposits the pollen which it has gathered from another flower; all the rest is simply "style." We may imagine the body or stem of the style to divide at its upper end into three leaves or branches, one of which becomes the "stigma" proper, while the other two are modified into the often very conspicuous "crests." Since the ovary is composed of three united carpels, each of which has a right to a style, I prefer to speak of three styles united at their bases, rather than, as Mr. Baker does, of one style dividing into three "style branches."

Krelagei, even when they are raised under conditions which seem to exclude the possibility of the parent having been crossed with *Krelagei*. For these reasons I am inclined to think that what we call the type is a special variety or sport, which Bieberstein happened to come across, and what we call the variety *Krelagei* ought to be considered as the type.

Be that as it may, *I. reticulata*, both in its typical form and in the variety *Krelagei*, is characterised not only by the netted coats of the bulb, but also by the peculiar form of the leaf, which is four-sided, square in section, and armed at the tip with a horny point. The only Iris outside the *reticulata* group possessing such a leaf is the peculiar *Iris tuberosa* of Southern Europe, of which I shall speak later on. The flower is sessile, but is thrown up above the as yet short leaves by means of the long tube, which is longer in the type than in the variety *Krelagei*.

The variety *Krelagei* differs from the type not only in colour and in form, but in the distinctness of the lateral veins on the claw of the fall; these, in the type, are lost in the general ground-colour. In the type the ripe pod is long and narrow, thrown up above the ground by a somewhat long pedicel; in *Krelagei* the pod is short and broad, and lies half buried in the ground.

The variety *Krelagei* varies very much in colour, being sometimes of a dull plum colour, sometimes of a rich red-purple, sometimes almost black; and it varies also much in size. From the type the late Mr. Nelson raised two varieties having all the general features of the type, except that in one the flower was larger than in imported specimens, and in the other the colour was not violet, but a peculiar light blue, varying, however, a good deal in tint. Mr. Max Leichtlin has also raised some seedlings of various shades of blue. All these are very beautiful, and one of Mr. Max Leichtlin's forms is an especially handsome flower. These more or less light blue varieties of the typical form are sometimes spoken of as the variety *cærulea*.

A few years ago there was introduced, under the name of *I. reticulata cyanea*, a small dwarf variety which differs from both the type and *Krelagei*, not only in being of a very striking blue, the blue known as cyanic, verging towards indigo, but also in form, size, stature, and in some other minor features. Three or four years ago I received, through the kindness of Dr. Reynolds, of Van, some specimens gathered near Van, in

Armenia, which resembled the above in form and other features, but which were purple in colour; and I have quite recently received from Mr. Allen, of Shepton Mallet, a plant also like the above in form and other features, but of a very pale blue colour. We obviously have to deal here with a distinct third variety of *reticulata*, which may or may not possess the distinct blue colour justifying the name *cyanea*.

A few years ago I received through the kindness of Mrs. Barnum, of Kharput, a fourth variety, which I described in the *Gardeners' Chronicle* as var. *sophenensis*. This is characterised by the narrowness of the segments and the metallic sheen of the coloration, as well as by the fact that the flowers expand as soon as, or even before, the leaves pierce the soil. This variety seems to occur in several shades of colour, from a red-purple to a lightish blue. It is fairly abundant in Central Asia Minor.

Quite recently Mr. Max Leichtlin has introduced, also from Central Asia Minor, under the name of var. *purpurea*, a fifth variety, which resembles *Krelagei* in colour, but in many of its features comes near to *sophenensis*.

And there is yet a sixth variety. But before I speak of this I must turn to a member of the *reticulata* group, found in Palestine, which has been described as a distinct species, under the name of *I. Histrio* (fig. 6). This, however, does not seem to me to differ more widely from the varieties of *I. reticulata*, of which I have just spoken, than do some of these from each other, and I therefore cannot help regarding it as in reality a variety of *reticulata*. Indeed it differs from *reticulata* chiefly by its colour, which is peculiar. The fall in its central parts is of creamy white, dotted over with blotches of a bright blue; these blotches fuse together at the edge and tip of the fall into a uniform ground colour of blue; the blue, however, is not a pure blue, having a slight admixture of red. There are certain differences in form between it and *reticulata*, but these are not marked; more distinctive, perhaps, is the habit possessed by the plant, that, unlike the other varieties of *reticulata*, the leaves acquire very considerable length before the flower expands.

I. Histrio is found in several places in Palestine, which country is also given as one of the habitats of the typical *reticulata*; but I have never as yet come across bulbs of the latter, about which there could be no doubt that they came from Palestine, and

its supposed occurrence in that country is probably based merely on herbarium specimens, which in this matter are not wholly to be trusted. On the contrary, I would rather say that typical *reticulata* represents the most eastern and *Histrio* the most western development of the species. This view being accepted,



FIG 6.—IRIS HISTRIO. (From the *Gardeners' Chronicle*.)

it is interesting to note that Western Asia Minor furnishes us with a form intermediate between the more ordinary *reticulata* and *Histrio*. This was brought to my notice some years ago through

the kindness of Miss Wright, of the American Mission in Amasia, and since then Mr. Max Leichtlin has obtained a large supply of it. This, the sixth variety of *reticulata* referred to above, in many specimens very strikingly resembles *Histrio* in its colour, being marked in the same way with bright blue spots and blotches; hence I propose to call it *I. reticulata* var. *histrioides* (fig. 7).



FIG. 7.—*IRIS RETICULATA* VAR. *HISTRIOIDES*.

It differs, however, from *I. Histrio* in exact tint of colour, in form, and in minor features, but especially in its habits. The flowers expand, like those of *sophenensis*, while the leaves are as yet hardly

above ground; it flowers distinctly later than *Histrio*, though often earlier than the ordinary *reticulata*, and, unlike *Histrio*, is perfectly hardy in this country. Moreover, though some specimens are spotted

and blotched very like *Histrio*, the plant

as a whole is very variable in colour, and some specimens are of a uniform blue, marked only by deeper veins. The flowers are often large, larger than in any other

form of *reticulata*, the segments being broad, broader even than those of the variety *Krelagei*, and the foliage is remarkably stout. It is a very handsome plant, and a great addition to our gardens.

So far for the actual species, *I. reticulata* and its varieties; but we now know three other forms, which, though they differ specifically from *I. reticulata*, must be considered as belonging to the *reticulata* group.

From the neighbourhood of Nazareth I obtained, through the kindness of Dr. Vartan of that city, an Iris (fig. 8) which in dried herbarium specimens has probably been confounded with *I. reticulata*, but which when cultivated proves to be

very distinct. It has netted coats to the bulbs, and four-sided leaves,

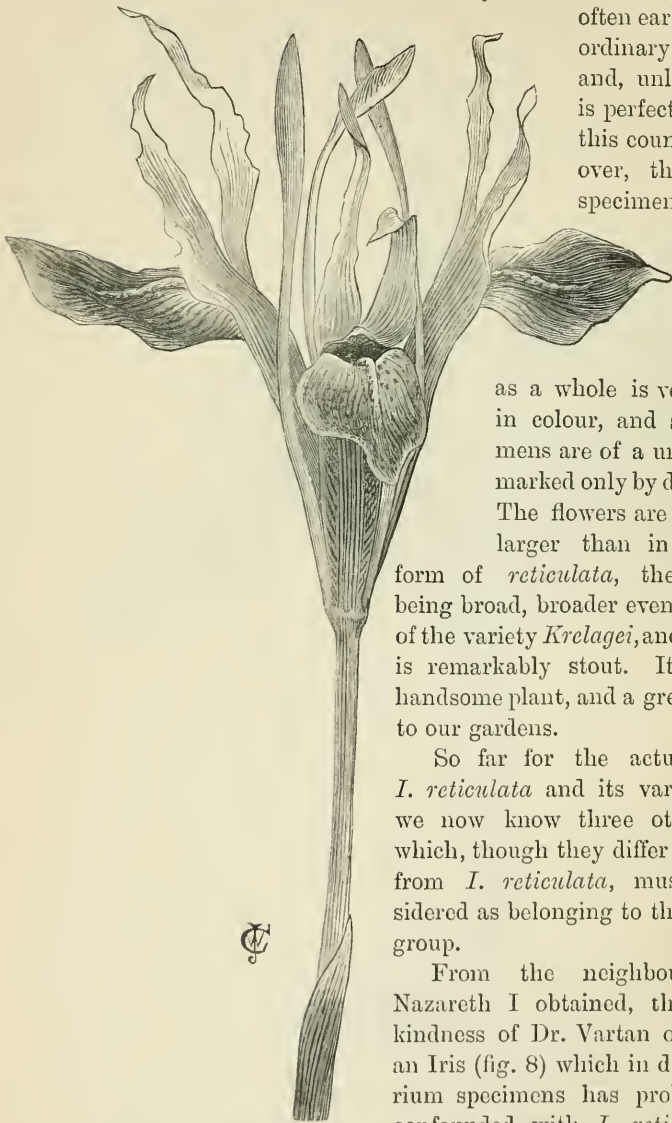


FIG. 8.—IRIS VARTANI
(Caparn).

each armed with a horny tip, but in the form of the flower, and especially in the narrow claw of the fall expanding into an oval blade, it is very distinct; moreover, it is unique (in the group) in habit, since it flowers in late autumn or early winter, the blooms often appearing in October. This habit, however, makes it difficult to cultivate in this country; and since the colour, a slaty blue, has no great merit, the plant is of botanical rather than gardening interest, and I need say no more about it. I have called it *I. Vartani*.

Of great gardening value, however, is another species of the group, *I. Bakeriana* (figs. 9 and 10), growing in the mountains



FIG. 9.—*IRIS BAKERIANA*
(reduced one-fourth).



FIG. 10.—*IRIS BAKERIANA* (a rather
small specimen).

above Mardin, on the confines of Armenia and Mesopotamia. This was brought to my knowledge by the Rev. Mr. Gates, of Mardin, and Mr. Max Leichtlin secured a large supply of it, and so introduced it into our gardens. It has bulbs with netted coats, and the flower closely resembles that of *reticulata*, differing chiefly in colour, the distinctive feature being that the deep violet blade of the fall bears a central patch of creamy white or yellow, sprinkled with dots or crossed with veins. Curiously enough, the leaves are not four-sided, but eight-sided, or rather

cylindrical with eight prominent spiral ridges; hence, though for gardening purposes it is a *reticulata*, we must botanically consider it as a distinct species. The specimens collected for Mr. Max Leichtlin vary a good deal in colour, and among them he tells me a beautiful white form has made its appearance. Dr. Cochrane, of Urumiah, kindly sent me some years ago bulbs from that district, which have proved to be those of *I. Bakeriana*; but the flowers differ in several respects from those found near Mardin.

Lastly, still keeping within the *reticulata* group, I must speak of a little yellow Iris growing in the South of Cilicia, imperfect specimens of which many years ago the accomplished traveller and botanist, Mrs. Danford, sent to Mr. Baker. This he described as *I. Danfordiæ* (fig. 11). Quite recently Dr. Born-



FIG. 11. — IRIS DANFORDIÆ.

The flower is not quite fully expanded and rather small. In the side sketch the minute standards are shown as seen from above.

müller rediscovered the same plant in another region of Asia Minor, namely Amasia, and Mr. Max Leichtlin happily obtaining a supply, distributed it under the name *I. Bornmülleri*, given by Haussknecht. Though the plants collected by Bornmüller vary somewhat, and Baker's description, being founded on imperfect specimens, was not complete, there can, I think, be little doubt that we are dealing here with the same species, and the earlier name *Danfordiæ* should therefore be used. The plant is in many respects of great interest. The bulbs have netted coats, the leaves are four-sided, armed with a horny point, the inflorescence and habit is that of *I. reticulata*, and the flower has many of

the features of a *reticulata* flower. But besides the colour being, except for a few dark green spots or veins on the fall and style, of a rich yellow, the flower of *Danfordiæ* stands quite apart from all the forms of *reticulata*, in that the inner segments or standards are almost abolished; they are reduced to mere spikes, hardly visible when the flower is viewed in the ordinary way. Still, on

account of its other characters, we must claim the plant as a member of the *reticulata* group. The flower, though of a beautiful rich colour, is small and low; it appears, as in some other forms of the group, while the leaves have as yet hardly speared.

These are the several members of the *reticulata* group as yet known to us; but I cannot help thinking that careful search in the country lying between the coast of Palestine on the west and Mid-Persia on the east will reveal to us yet other forms. And even with those which we now possess a promising future lies before the cultivator and the hybridiser. From seeding, and especially from crossing the newer forms with the old, many brilliant results may be expected; we may be glad that the ever-active Mr. Max Leichtlin is carrying on the work which the late Mr. Nelson began. Among the forms we at present possess, the typical *reticulata*, especially Nelson's large seedling, holds beyond doubt the first place. Next, to my mind, comes the variety *histrioides* in its best forms, with *Bakeriana* and *Danfordiæ*, the latter so especially welcome for its yellow hue. *Histrio* is beautiful, but too tender for common use, and hence, next to the above, I should put the variety *cyanea*, followed by some of the better forms of *Krelagei*, *sophenensis*, and *purpurea*. As I have said, the variety *Krelagei*, especially as shown in seedlings, is variable, and while some forms are hardly worth growing, some of them are exceedingly beautiful, and, in my eyes, rank not much below the type.

One word as to fragrance. For the development of this, in any of the forms, warmth is necessary. The typical *reticulata* is the most constantly fragrant of the group, but on a cold February or March day even this, in the open, may fail to give out an appreciable odour. With the other forms fragrance is uncertain; a pot of *Histrio* in a warm greenhouse is deliciously sweet, but in a cold border is almost inodorous; *Bakeriana* is generally fragrant, as are also many specimens of *histrioides*, but *sophenensis*, *purpurea*, and *cyanea* are generally inodorous. As a rule, *Krelagei* has no scent, but some specimens, especially in warmth, are delicious; and that, too, even though the flowers may be extremely poor in colour. The occurrence of fragrance is in fact extremely capricious, and no hard-and-fast line can be laid down. The nature of the fragrance, the exact kind of odour, differs in the different forms.

As to time of flowering in this country, the following seems to be the order, though variations occur, and the exact date will of course depend upon situation and special climatic conditions. The first to appear is *Vartani*, followed after a long interval by *Histrio*. Then come more or less together, sometimes one and sometimes another being in advance, *Danfordiæ*, *Bakeriana*, *sophenensis*, *histrioides*, and *cyanea*. *Krelagei* and *purpurea* are somewhat later, and the so-called type, as a rule, flowers the last.

The cultivation of the *reticulata* group has chiefly to be directed towards combating a disease, in the form of a minute fungus, which attacks the bulbs when left in the ground, and the presence of which, in the dry bulb, may be recognised by the coats being splashed with black as if marked with ink. When this disease makes its appearance the foliage prematurely withers, and the bulb speedily rots away, leaving behind an imperfect husk filled with black powder. In any garden to which the fungus has gained access, bulbs left in the ground soon perish; what one year is a beautiful clump full of bloom, may next year be represented by one or two flowers only, or not even by that. I am by principle adverse to too much meddling in the garden, but, through successive heavy losses, I have been driven to move all my *reticulatas* every year. I take the bulbs up as soon as the foliage has died down, keep them for a while in dry sand, and, before I replant them in fresh ground in July, go carefully over them all, removing the coats which by their black patches show signs of the fungus, and placing all really diseased bulbs in a reserve ground by themselves. By this method I find that I largely diminish the disease, though I have not as yet wholly stamped it out. Sometimes one variety, sometimes another, seems to succumb soonest to the enemy; I do not find that any one kind permanently resists attack, but have in turn lost patches of each kind. If I fancy one kind is disease-proof because it stands several years, I am undeceived at last.

Beyond this, and the selection of a sunny, sheltered spot, dry, or at least not too wet in winter, no special culture is required. The plants will thrive in sandy peat, but they will thrive as well, or even better, in stiff clay. When I have received imported bulbs, the soil attached to them has generally been some kind of stiff loam, and when I have sought information as to the soil

in which wild plants have been found, the answer has usually pointed to a stiff and loamy rather than to a light or sandy soil. My own experience has also led me to choose for them a moderately firm loam; and, with the method of lifting annually, I do not hesitate to make the ground as rich as possible. When the bulbs are taken up every year I do not find those planted in heavily manured ground more diseased than those planted in virgin soil free from manure.

Much pleasure may be gained in the dull, dreary days of December and January by growing these *reticulatas* in pots, and flowering them in a greenhouse. For this purpose they should be potted at midsummer, plunged in a cold frame, protected from excessive autumnal rains and from early winter frosts, and brought into a cool greenhouse just as the buds are about to expand. They are somewhat difficult to manage after they have flowered; and whether they be kept in the greenhouse (where their long foliage, necessarily increased in length by being "drawn up," is a source of trouble), or whether they be returned to their chill home of a cold frame, they never ripen bulbs as do plants living in the open. Moreover, the giving them the proper quantity of water, neither too much nor too little, needs very careful judgment, and errors in this matter tend very markedly to injure the bulbs. Hence it is advisable to make use each year of bulbs which have been previously grown out of doors.

Several members of the *reticulata* group, such as *sophenensis*, *histrioides*, *Vartani*, and others (I have not observed this in the type or in *Krelagei*), throw out a very large number of small bulbils round the base of the bulb. If these are planted separately in a reserve ground, they will develop into flowering bulbs in the course of two or three years.

Considering the time of year in which they flower, the *reticulata* Irises go to seed fairly well. In gathering seed care should be taken not to overlook the seed-pods, which are often more or less buried in the ground. The seed, if sown as soon as ripe, will to a large extent germinate in the following winter and spring; but some of it may lie dormant for two, three, or even more years. Germination is more certain when the seed is sown in the open than when it is sown in pots or pans, owing probably to adequate moisture being thus more regularly secured. But the seedlings which appear in December or January from

the summer sowing need protection if the winter is severe, and in general the management of the seedlings is more easy in pots than in the open ; a pot can, for instance, be easily preserved and watched for three, four, or even a longer number of years when germination is tardy, whereas it is difficult to keep a seed-patch in the open, or even in a frame, clean of weeds and otherwise preserved for such a length of time. Hence it is, I believe, the best to sow in pots, choosing somewhat deep pots rather than shallow pans, since the roots strike deep. But the young bulbs, after their first year's growth, will thrive better in the open, though they will benefit by protection in winter for one year more. Seedlings of *Vartani* certainly, and of *Histris* to a large degree, will need protection at all times.

Before leaving the *reticulata* group, I must mention a little



FIG. 12. IRIS KOLPAKOWSKYANA.
(From the *Garden*.)

Iris, *I. Kolpakowskyana* (fig. 12), an inhabitant of Turkestan, named after a Russian general who has done much to further our knowledge of the botany of Central Asia. This is an outlying member of the group, being to a certain extent intermediate between *I. reticulata* and *I. Sisyrinchium*. It has netted coats to the bulb, and the flowers are single and sessile, but in its leaves it resembles *I. Sisyrinchium*, as indeed it does also the features of the flower. It is a charming little plant, the falls presenting a beautiful contrast of rich red-purple and bright golden yellow; but for some reason or other it is most

difficult of cultivation in this country; imported bulbs die for the most part after the first year, and I much fear that it will never become a garden favourite.

I. Winkleri, also from Turkestan, described by Regel, I have never seen; though allied to the above, it appears to diverge still more from the *Reticulata* group, for the coats are membranous, not netted.

The Xiphium Group.

We must now pass to another group of bulbous Irises, which is as markedly western and European in geographical distribution as the *Reticulata* group is eastern and Asian, and which we may



FIG. 13.—*IRIS XIPHUM*, or SPANISH IRIS. (From the Garden.)

regard as a development in a direction different from that of the *Reticulata* group from a common ancestor, now represented, as I have suggested, by *I. Sisyrinchium*, found alike in Europe and in Asia. This group I will venture to call, after its best known member, the *Xiphium* group, in spite of the allied term "Xiphion" being applied, unfortunately, I think, to the entire bulbous division of Irises. Naturally enough, several members of this group have

long been known to European gardens. The bulbs have membranous, not netted coats ; the leaves are not four-sided, though for the most part long and narrow, almost linear ; and the flowers, generally two, but sometimes one only, are borne on stems of some, and often of considerable, height.

Two species of this group are exceedingly well known : *Iris*



FIG. 14.—*IRIS XIPHIODES*, or ENGLISH IRIS. (From the *Garden*.)

xiphium (fig. 13), the so-called Spanish Iris, whose headquarters are in Spain, Portugal, and Algiers, but which stretches into Southern France and Italy, and *I. xiphioides* (fig. 14), the so-called English Iris, found in the Pyrenees. The latter came into the hands of the Dutch gardeners by way of England, being

carried from Bordeaux to Bristol, and so to Holland ; hence the name. I need not dwell at length on the characters of these two forms, so well known to all.

The differences between the two are many and striking. The foliage in the English Iris is much broader than in the Spanish Iris, and while the latter often "spears," and with me always does so, in late autumn, the shoot appearing as an awl-like spike, the latter does not spear until spring, and the shoot on its first appearance has more the form of a nipple. The parts of the flower of the Spanish Iris are narrow, rigid, formal, the fall is extended more or less horizontally, and the style lies close down upon the fall, so that the tunnel leading to the nectar is very complete ; by reason of these features the flower has a striking resemblance to that of the "spuria" group of rhizomatous Irises. The parts of the English Iris are much larger and broader, especially the blade of the fall, are lax, with a more graceful sweep, and the edge of the fall is generally very wavy ; the style is often raised high above the fall, so that the tunnel is a very open one. The colour of the Spanish Iris, taking in all its varieties, is limited to blue, blue-purple, yellow, and white, with a variable admixture of brown, a distinctly red-purple or red never occurring. The colour of the English Iris is limited to blue, to purple of all tints from a nearly pure blue to a nearly pure red, and to white, yellow being conspicuous by its absence. The bulb of the English Iris is larger than that of the Spanish, and the outer coats are apt to fray out into fibres, especially in their upper parts, so that the bulb becomes shaggy ; the coats of the Spanish Iris are always much smoother. The ripe capsule of the Spanish Iris is long and narrow, generally more or less club-shaped, broader above than below, and the three sides are deeply grooved ; the sides of the young ovary already possess these grooves. The ripe capsule of the English Iris is larger, broader, pointed above and below, more distinctly triangular, with flat even sides. Lastly, while the seeds of the Spanish Iris are small, and cubical or wedge-shaped, those of the English Iris are larger, and oval or pyriform ; they are, moreover, less numerous in the pod, and, as old Parkinson observes, "rattle in the dry husk."

The wild forms of the English Iris, *I. riphioides*, which have come into my hands have always been of a deep rich blue, and,

so far as I know, in a wild state it varies little in colour. The variously tinted garden forms of which I spoke just now, the red-purple and the almost red kinds, as well as the very common forms in which a white ground is more or less splashed with blue or blue-purple or red-purple blotches, are the outcome of the repeated seeding to which this species for some two or three hundred years has been subjected in cultivation. But as I said, a yellow plant is unknown; this colour has never made its appearance during the many, many generations of seedlings. Moreover, so far as I can ascertain, though repeated seeding has produced great variety of colour, it has hardly affected at all the structural characters of the plant; the various forms now cultivated, apart from size and colour, are all exceedingly alike. This is interesting in connection with the narrow geographical distribution of the species. *Iris xiphioides*, indeed, may be regarded as the type of a really good species. It differs from all its allies by characters so broad as to be obvious to everyone; it exhibits little or no tendency to vary, or to form hybrids with other species. It at some time or other acquired certain features, and those early became so rigidly fixed that it speedily lost all power of adapting itself to varied circumstances, and hence has proved unable to spread outside a very limited home.

The Spanish Iris, *I. xiphium*, on the other hand, has not only a much wider range, spreading throughout the greater part of Spain and Portugal into the African continent, and reaching both into France and into Italy, but also comes very close to other species; so much so that between them and it the question of specific differences is soon raised. Among the wild forms two types may be recognised. In the one, the falls, which are relatively narrow, spread out horizontally, the ovary protrudes from the spathe-valves for some distance, and the prevailing colour is blue or purple. In the other, the claws of the falls, which are relatively very broad, rise up in a slanting fashion, so as to form more or less of a funnel; the flower is "turbinate"; the ovary is much less exserted, and the dominant colour is yellow. The latter form is found in Portugal, and hence, though the other blue form is also common in that country, has been called *I. lusitanica*; a variety of it, in which the colour is not pure yellow, but heavily blotched with brown, is the *I. sordida* of Salisbury.

The Spanish Iris, like the English Iris, has been largely propagated by seeding, and we now possess a very large number of varieties of many tints of blue, blue-purple, purple, yellow, and white, many of the flowers being parti-coloured, and a peculiar effect being produced in some by the admixture of brown, giving a bronzy hue. In all these we may recognise the two types of which I just spoke variously intermingled. To those which show traces of descent from the *lusitanica* stock—such, for instance, as “Sultane”—the turbinate arrangement of the parts, and the way in which the styles are overlapped laterally by the broad claws of the falls, confer on the flower an aspect which contrasts strongly with that of a flower—such, for instance, as “Don Carlos”—having the characters of the type, the falls being nearly horizontal as well as long and narrow, so that the centre of the flower is much more open, much less closed up. As a rule, the varieties which affect the *lusitanica* form also tend to be yellow, and those with the more typical characters are chiefly blue; but this rule is by no means closely followed. Some very beautiful varieties have the falls of a pure yellow and the standards of a lovely blue.

When a number of plants are examined, very many small differences in the shape of the parts are met with, such as the relative breadth and length of the fall, and the depth of the constriction which separates the claw from the blade, in the relative length and breadth of the standard, and in the presence or absence of a notch at its apex, and in the crests of the styles, which are generally broad and quadrate, but may be narrow and almost triangular. The standards are sometimes widely spread out, very divergent, but sometimes are connivent, almost meeting in the centre; sometimes they are very twisted, but sometimes quite straight.

So far as one can judge from the old descriptions, such as those of Parkinson, and from old figures, preserved in the British Museum and elsewhere, several striking varieties known in old times have been lost to cultivation. We possess one marked variety of vigorous growth, with striking bronze flowers, commonly known as “The Thunderbolt” (fig. 15), but sometimes called “sordida”: erroneously, since it has nothing to do with the *I. sordida* of Salisbury. This, which seems to have been known to Parkinson, unlike the other varieties, rarely bears seed; and

I have no doubt but that it is a hybrid, probably between the yellow *lusitanica* variety and either *I. filifolia* or *I. tingitana*, of which I shall speak presently. This may be the *Iris spectabilis*



FIG. 15.—*IRIS XIPHUM* var. "THE THUNDERBOLT." (From the *Garden*.)

of Spach, which he regards as probably a hybrid between *I. xiphium* and *I. xiphioides*; but I see in "The Thunderbolt" no trace of *I. xiphioides*, nor, indeed, have I as yet come across any

plant showing any admixture of *I. xiphium* and *I. xiphioides*, with either as seed-bearer.

Beyond the two types spoken of above, the wild forms of *I. xiphium* do not vary much in structural features; but Mr. Maw, some years ago, sent me a plant which he had found in the Sierra Nevada, having some special characters; and two or three years ago I received, by the kindness of the esteemed botanist of Algiers, M. Durando, a bulbous Iris found by M. Battandier near the Marais de la Rassanta in Algiers. The flowers of this, which are of a beautiful pure white colour, differ so markedly in form from those of *I. xiphium* as to justify varietal, if not specific, distinction. In all the ordinary forms of *I. xiphium* the fall is fiddle-shaped in outline; in this it is hardly more than spatulate. It almost deserves the specific name of *I. Battandieri*; but, on the whole, I am inclined to speak of it as a variety or sub-species. It is a very handsome plant, but, so far as my experience goes, not so robust as the type.

Concerning an Iris inhabiting Algeria, and known as *I. Fontanesii*, since I have not as yet been able to obtain it for cultivation, I will, for lack of knowledge, say nothing, except that while some have apparently given this name to Algerian specimens of *I. xiphium*, others believe it to be a form of an Iris of which I will speak directly, *I. tingitana*; and others, again, regard it as a distinct species. For a similar lack of knowledge, I will say nothing of the *I. serotina* of Wilkomm, since this also I have never seen; but from the description it seems hardly more than a small variety of *I. xiphium*.

As a near ally to *I. xiphium* comes the *I. filifolia* of Boissier, found in Spain, at Gibraltar, and in Morocco, and differing on the one hand by possessing a perianth tube, though this feature seems variable, and on the other hand chiefly by the red-purple colour of the flowers, and by the great breadth of the "signal" or golden patch on the blade of the fall beneath the stigma. It is also less robust than *I. xiphium*, and has scantier foliage, though a form in which the leaves are relatively large and broad occurs near Tangier. It crosses readily with *I. xiphium*, the offspring having intermediate characters.

More common than the above in Morocco is *I. tingitana*, which has a most distinct perianth tube above the ovary, and the bulbs and flowers of which are much larger than in either

I. xiphium or *I. filifolia*. The segments are much larger than in either of these, and the blade of the fall is more oval, more lax, and with a tendency to be wavy at the edge; in fact, the flower shows a certain analogy with *I. xiphioides*. Indeed, *I. filifolia* and *I. tingitana* may be regarded as the counterparts of *I. xiphium* and *I. xiphioides* respectively; and, geographically, we have *I. xiphioides* as the extreme northern and *I. tingitana* as the extreme southern representative of this section, the two being separated by *I. xiphium*.



FIG. 16. — IRIS BOISSIERI
(reduced one-fourth).

Differing more widely from the above than any of them from each other is *I. Boissieri*, discovered a few years ago by Mr. Tait, of Oporto, in the Gerez Mountains of Spain (figs. 16 and 17). It is not only dwarf, the short stem bearing as a rule one flower only, but the flower possesses a long, narrow perianth tube above the ovary, and the form of the segments is very different from that of the other members of the group, the narrow claw of the fall suddenly expanding into a broad blade, and the standard being broad and short. A singular feature of the flower is that the yellow "signal" of the fall bears a number of short hairs, almost forming a "beard." In many respects it draws near to *I. Sisyrinchium*, and we may perhaps regard it as a remnant of an older form of Iris which was once prevalent in Spain, but which has been pushed out by the newer *I. xiphium*. The rich red-purple of its flowers makes this Iris a welcome addition to our gardens.

We may place in this group too the beautiful *I. juncea* (fig. 18) with its handsome, fragrant yellow flowers, though it differs widely from *I. xiphium* in the characters not only of the flower, but also of the bulb. The bulbs are more globose, not so elongated as those of *I. xiphium*, and, as they grow old, become covered with a nest of stiff brown coats. The flower, which possesses a

very long, narrow perianth tube, is more graceful in form than that of *I. xiphium*, less formal and rigid, having a more pleasing sweep of outline; and the rich golden colour, together with a distinct fragrance, which is absent or extremely rare in the other members of the group, renders it a most delightful plant. It has, moreover, a wider geographical distribution than have its fellows; it is not only found in Southern Spain and in Northern Africa (Algiers and Morocco), but stretches away through Sicily to Italy, occurring in the Riviera. A lemon-coloured variety from Africa is in cultivation, under the name var. *numidica*, but otherwise this species varies very little.

Turning now to the cultivation of this *Xiphium* group of Irises, the first thing to note is the contrast between the needs of *I. xiphium*, the Spanish Iris, and *I. xiphioides*, the English Iris. Both profit, as regards vigour of bloom, by good exposure to sunshine; but while the Spanish Iris delights in a dry spot, the English Iris insists on an adequate supply of moisture at its roots in summer. Hence, as a rule, where the one thrives the other fails. In my own dry garden, for instance, I find no difficulty at all with the Spanish Iris; the bulbs multiply rapidly and bloom freely, and seedlings grow apace. Provided that the plants are not enervated upon by the roots of too vigorous neighbouring perennials, or smothered by too luxurious annuals (for these, and indeed all bulbous Irises, make but a poor fight in the struggle for existence), they will flourish in the same spot for

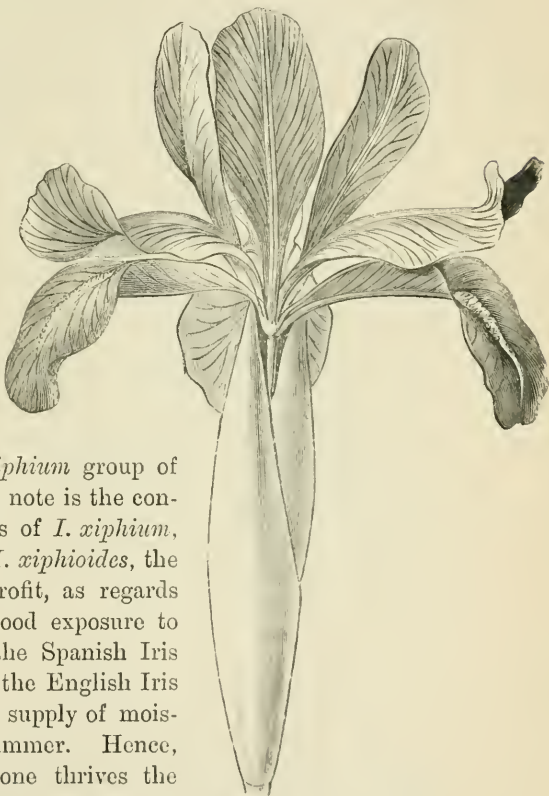


FIG. 17.—IRIS BOISSIERI.

several years at least in succession. The English Iris, on the other hand, I can only keep alive by careful effort; as the soil becomes dry in spring and early summer, the foliage becomes pale and lags in growth, yielding only few and feeble flowers. They need far more moisture than they can get by any watering which I can give them. The different circumstances under which the two forms naturally thrive is indicated by their manner of growth. The Spanish Iris begins to shoot in late autumn, and the foliage has reached some height before winter sets in; from which we may perhaps infer that in its native

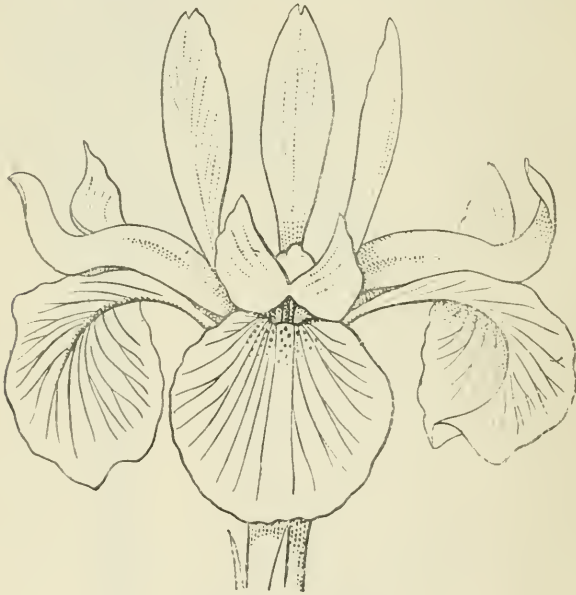


FIG. 18.—IRIS JUNCEA.

home it has little to fear from the soddening effects of a wet winter. The English Iris, on the other hand, does not spear until winter is practically over; in its native wet habitat it has learnt to avoid winter growth. Hence, as a rule, in every garden it is only either the Spanish Iris or the English Iris which will flourish without special care; and one of the golden rules of gardening, "Grow the plants for which your surroundings are fitted," may be applied very forcibly here. If he whose garden is adapted to the English Iris wishes to grow the Spanish one,

let him take the bulbs up yearly, planting them somewhat late, choosing each year, as far as may be, a sunny, dry spot where the soil is a moderately light but not too sandy loam. He, on the other hand, who fights against fate for the English Iris, should choose his dampest but unshaded situation, giving the preference as regards soil to a black vegetable mould rich in humus, and supply artificially the moisture which may be lacking to the plants while they are making foliage and preparing to bloom.

The other members of the group seem always to require special care. *I. filifolia* and *I. juncea* show more pressing needs than *I. xiphium*; they not only need a dry, hot spot, but they must be kept dry in the summer for some time after flowering. The easiest way to effect this is to lift the bulbs annually, re-planting somewhat late, and they bear this shifting without harm. If they are to be left in the ground, the place chosen for them should be a hot, dry spot on the top of a rockery, with no more soil than can be well drained in winter and baked dry in summer; but under such circumstances they are apt to be starved. As far as my experience goes, they are more vigorous in a moderately stiff loam than in a more distinctly sandy soil.

The cultivation of *I. tingitana* is peculiarly difficult in this country, at least in most districts. The plants start growth early, and their relatively broad, ample foliage is terribly punished by winter storms. Moreover, they need genial moisture and more decided warmth in early spring, just as they are preparing to flower (for they should bloom in April or early in May, long before the Spanish Iris), than they obtain in most parts of this country. The plants are hardy enough, in the sense that they can, unprotected, stand without injury even our severest frosts; not winter, but cold, cutting spring is their enemy; they live, but they refuse to bloom. I sent to a friend on the Riviera some bulbs which had been growing and increasing with me for several years, and yet without yielding a single bloom; even in the first spring of their sojourn in that more genial land they bloomed profusely. I very much doubt whether any artificial care can ever in this country supply what this plant needs to bring out the magnificent blooms which it ought to give.

Of the cultivation of *I. Boissieri* I cannot say much, except

that the want of success which I have had with it leads me to infer that it, like the English Iris, needs more moisture in spring than my circumstances will admit.

Most of the *Xiphium* group go to seed freely, and the seed, as a rule, germinates readily; by far the greater part of the seed sown in the summer as soon as ripe sprouts in the following spring. The seed of *I. xiphium* starts very early, and when the seed is sown in the open the young seedlings are apt to be damaged, thrust out of the ground, and otherwise injured, or even killed, by late frost; hence, to secure a full crop of plants from a batch of seeds, some protection is advisable. But when seed is plentiful a little loss is of no great moment, and my practice now is to sow in the open in a prepared bed, and to let the seedlings remain until the bulbs are for the most part ready for flowering. The seed of *I. xiphioides* is much later in germinating, does not start until spring is fairly advanced, and hence does not need any protection at all; care, however, should be taken that the young seedlings do not suffer from drought.

Iris tuberosa.

I may, perhaps, here say a few words about a charming little plant, which is not a bulbous Iris in the strict sense of the word, and which, indeed, by some authors is not considered an Iris at all, and which yet has certain affinities with the bulbous Irises of which I have been speaking. I mean the plant with lovely black and green flowers, known in some of its native homes as "The Widow" (*la vedova*), and called by the majority of authors *Iris tuberosa* (fig. 19), but by others *Hermodactylus tuberosus*. It was separated by Salisbury as a distinct genus, with the name just given, because the ovary is not, as in Iris, divided completely into three chambers by three septa or partitions meeting in the middle along the whole length of the organ; the partitions are imperfect, not meeting in the upper part of the ovary, which thus consists of a single chamber, partly divided by the projecting partitions. Otherwise all the characters of the plant are those of an Iris; and, since the lack of complete fusion of the partitions of the ovary may occur accidentally in many specimens of Iris, it seems unreasonable to lay such great stress on this feature. I shall, therefore, continue to consider it as an Iris. But, as I said, it is not strictly a bulbous Iris; if you dig up a

plant when the foliage dies down you will find, not a bulb, but an irregular brown *tuber*, like a small, hard, deformed potato, the mass being often made up of two, three, or more parts joined together like the fingers of a hand, or perhaps more like a star-fish. The change, however, from a regularly formed to an irregular tuber is not a great one; and, indeed, if you sow the seed of *I. tuberosa*, you will find that the product of the first year's, and indeed of the second year's growth, is a small rounded nodule which you would at once say is a bulb; this Iris is a bulb (in the loose sense of the word) when it is a baby, and becomes a tuber as it grows old. We may probably infer that, though we must now speak of it as a tuberous Iris, it has descended from ancestors which were undoubtedly what we should call bulbous.

The plant has one very striking feature: the leaf is four-sided, with a horny point, like that of *I. reticulata*; indeed the differences between the leaves of the two plants are relatively small, and a casual observer might easily confound the two. The flower, again, in another feature draws near to a member of the *Reticulata* group, namely, *I. Danfordiæ*; the inner segments or standards are



FIG. 19.—IRIS TUBEROSA. (From the *Gardeners' Chronicle*.)

reduced to mere bristles, so that at first sight they seem to be absent. On the other hand, the plant betrays its affinities to *I. Sisyrinchium*, in the filaments of the anthers being in part of their course united together. We may place side by side with these structural features the geographical distribution of the species. While the *Reticulata* group, as we have seen, is confined to the east, and the *Xiphium* group to the west, *Iris tuberosa* stretches from almost the extreme west a long way towards the east. Beginning at the west in Southern France, we may trace it through the Riviera, Corsica, Sicily, Middle and Southern Italy, past Dalmatia to Greece and the Grecian Islands, and even to Turkey. So far as I know, however, it is absent from Asia Minor. In width of distribution it is second only to *I. Sisyrinchium*, and, like that, is probably a somewhat ancient *Iris*.

The flowers, which are probably known to most, are singular in colour. The ground colour of the fall is an olive-green, which on the blade becomes a dark, almost black, velvety purple; this combination, with an occasional admixture of yellowish or of bright green streaks, is to my mind, as to that of many others, especially charming; it has a beauty all its own. The flower is single, borne on a stalk of variable length; the spathe-valves (one of which is often missing) are large and swollen, and the relatively large swollen pod is a conspicuous object when the foliage is ripening.

The flower differs in minor characters, in form and in colour, in its different habitats, so much so that authors have made more than one species; but we ought probably not to consider them as other than mere varieties.

As regards the cultivation of *I. tuberosa*, I can only say that in this country it seems to need the sunniest, driest spot which can be given to it; and, so far as my experience goes, it does better in a moderately light loam than in any other soil. Where it thrives, it is perfectly hardy, in the sense that though the foliage may shoot, and even acquire some height, in late autumn, the severest winters leave it untouched; but it is sorely tried by the harsh spring winds and dry cold which are apt in England to visit us in March and April, when it should be in flower. Yet it is exceedingly capricious. In some places it refuses to flower, and, indeed, to grow. In my own garden it multiplies rapidly, and, indeed, I find a difficulty in getting rid of it from any place

in which it has been planted; possibly my calcareous soil is acceptable to it. Yet, while some years it flowers freely, in other years the blooms are very scarce. On the whole, it seems to me to do much better when left undisturbed in the ground year after year than when it is lifted, though some of the older writers recommend that it should be lifted, not every year, but every three or four years. It does not lend itself readily to pot culture; at least that is my experience.

The Juno Group.

I must now pass on to another large group of bulbous Irises. In the two groups which we have been considering, both the *Reticulata* group and the *Xiphium* group, the bulb is composed of two or three thick, fleshy coats (the swollen remnants of the bottoms of leaves which have vanished), wrapped round the baby central shoot, and surrounded in turn by a certain number of thin membranous wrappings, varying in the different species. The bulb, if examined when ripe, is found to be free from all roots, the old ones having wholly disappeared, and the new ones not yet sprouted.



FIG. 20.—*IRIS PERSICA* (reduced).
(From the *Garden*.)

The leaves, moreover, in all the members of the group are few, often two only, and relatively long and narrow; in many cases, as we have seen, almost linear. By the possession of these characters, the two groups form a single group, to which the name *Euxiphion* has been given.

As a typical member of the other group of which I am about to speak, let me now call your attention to an Iris, which is a very old garden favourite, well known to Parkinson, Gerard, and even Clusius, an Iris which has the honour of being depicted in plate 1

of the long, admirable series of plant portraits known now as the *Botanical Magazine*, and which is probably familiar to all as the Persian Iris, *Iris persica* (figs. 20 and 21). It is, like the members of the *Euxiphion* group, a bulbous Iris; but the bulb is composed not of two or three very fleshy coats, but of several less stout coats, surrounded, as in *Euxiphion*, by mem-

branous wrappings. If you take the bulb up in summer, when the foliage has died down, you will find attached to the base of the bulb a number of fleshy, finger-like, but somewhat tapering roots,

each with a narrow neck, easily broken at its attachment to the bulb. In the case of purchased, stored bulbs these conspicuous roots have often been broken off, and the bulb then

does not differ in outward appearance very markedly from a *Euxiphion* bulb; but when the ripened bulb is taken direct from the ground these fleshy roots are always present. If you study the history of the plant during the yearly cycle of its life, you will find that, as the foliage and bloom are developed, these thick roots shrink, and finally disappear; when the plant is at the height of its vegetation, only their shrivelled remains are to be seen. But as the leaves are withering in the ripening process, new roots of the same kind are formed, which become thick and stout, like the new bulb which is forming while the leaves of the past season fade and depart. Obviously

these thick finger-like roots are, like the thickened coats of the bulb itself, stores of nourishment for the coming plant. In *Euxiphion* the plant possesses such stores only in the thick coats of the bulb itself; in *Iris persica* the plant can fall back upon the supplementary stores afforded by these peculiar thick, fat roots.

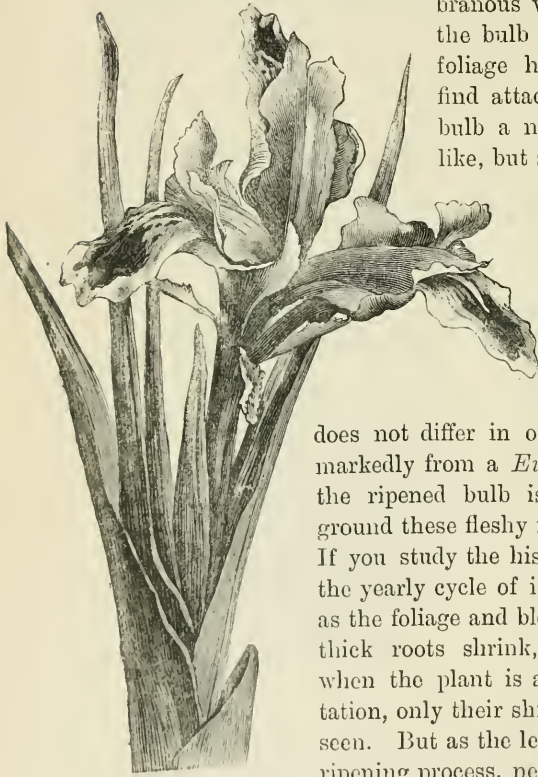


FIG. 21. — *IRIS PERSICA* (natural size, but a rather small flower). (Caparn.)

Now these two features, the having several coats to the bulb and the possession by the ripe bulb of thick store roots, are common to a large number of Irises, which thus form a group known as the *Juno* group. These two characters are, moreover, accompanied by certain others. Thus the leaves are usually broader and more numerous than in the *Euxiphion* group, though this feature is somewhat variable. Again, in most cases, in nearly all cases in fact, the flower has a special form. The outer segment or fall, instead of having, as in most Irises, the claw narrower than the blade, is broadest at the claw, which is expanded sideways into two angular flanges or auricles, one on each side. Further, in nearly all cases also, the inner segment or standard is very small, reduced often to a mere bristle, and usually takes up a horizontal position, or is even turned directly downwards instead of standing erect. To compensate, as it were, for the smallness of the standards, the crests of the styles are unusually large, and form a conspicuous part of the flower. These several features, and other minor ones on which I need not dwell, characterise this *Juno* group of bulbous Irises, and may be spoken of as the "*Juno* characters."

Iris persica, in the typical form so long known—the stock which has been so long in cultivation coming, it is stated, from South Persia, in the region between Murgab and Persepolis (I have not come across any recent importations of this typical form)—is a striking and yet beautiful plant, with a deep violet, almost black, patch on the lamina of the fall, forming a pleasing contrast to the white or bluish-green tint of the rest of the flower. In nearly all these *Juno* Irises the middle line of the claw of the fall is raised into a ridge or crest, which fades away as it passes on to the blade; this ridge or crest has usually a distinct colour of its own, and in *Iris persica* is a bright golden-orange, setting off and set off by the deep violet of the blade of the fall.

The short, hardly visible stem generally bears (in March, sometimes earlier, sometimes later) one flower, which appears sessile, but at times has two, or even three flowers. The leaves, which have only just speared when the bloom appears, and do not attain their full growth until long afterwards, are narrower than in most other *Junos*, and the bulb when well grown is large, being sometimes as big as a hen's egg.

The plants of *Iris persica* in cultivation are all very much alike, and Miller remarked long ago that seedlings showed little or no variation from the parent. Within the last few years, however, we have obtained from various parts of Eastern, Central, and Southern Asia Minor a number of forms differing from the typical *Iris persica*, more particularly in colour, but also, to some extent, in form. Mr. Max Leichtlin, for instance, has recently distributed, under the name of *I. persica* var. *purpurea*, one of these varieties found in several parts of Central Asia Minor, which differs from the type chiefly in that nearly all the parts are of a red-purple; the blade of the fall, however, is especially dark, and the orange signal on it affords the usual contrast. Neither the fall nor the standard has exactly the form which prevails in the type; and did we possess only this purple variety, we might perhaps grant it the dignity of a specific distinction. But this is not the only variety. I have received from Mrs. Barnum, of Kharput, and from the Rev. Mr. Gates, of Mardin, and Mr. Max Leichtlin has received from these and other parts of Asia Minor, plants having the general characters of *Iris persica*, but differing not only widely in colour—some being reddish, others violet, others, again, steel-grey, or even sea-green—but also considerably in the form of the fall, more especially in the relative proportions and details of the blade and the claw. Each of these, contrasted with the type, is so distinct that it might well be regarded as a new species; but this would entail the institution of a dozen or more new species. Hence, as in other instances, we are driven to consider the different forms as varieties only, so that *Iris persica* is, after all, an extremely variable plant. A plant growing in South Persia, below Shiraz, for bulbs of which I am indebted to Mr. Isaacson, of Bushire, differs so much from the other varieties of *I. persica* that I am somewhat inclined to consider it as a new species, but I am in doubt, and have provisionally described it as merely var. *Isaacsoni*. None of these varieties, to my eye, equal the singular and striking beauty of the old typical form, but they are, nevertheless, nearly all of them welcome additions to the garden. Most of them flower earlier than the typical form.

Iris persica is often spoken of as “not hardy,” and we are recommended to grow it in a frame or greenhouse. If by “not hardy” is meant “succumbs to severe winter frost,” the term

cannot be applied to *Iris persica*, since the bulbs underground will stand, untouched, the severest frosts that ever visit England, and, indeed, in many of its native homes it has to endure severer frosts than those which visit this country. Nevertheless, it is in many places difficult of cultivation, and for the following reasons : it needs, when blooming and growing, genial mild warmth, and when it has done growing, it needs to be ripened by heat and drought. In this country, in most districts at least, it is pinched with dry, cutting winds when it is young and tender, and drenched with warm rains when it ought to be at rest ; hence bulbs, even large and vigorous when planted, often refuse to flower beyond the first year, and soon after disappear altogether. The Dutch nurserymen, I understand, meet the difficulties of climate by lifting the bulbs every year, and I believe that that is the best course for most of us in this country also to observe. This "climatic" treatment seems to be of much more importance than the choice of soil. "Sandy peat" is, as usual, recommended by many, but in its native home, in most cases in which I have obtained information, it is found in loam, often of a very stiff character ; and my own experience leads me to think that the stronger soil yields the stronger plants. So far as I can see, the Asia Minor varieties need the same treatment as the typical form.

If we take the Asia Minor forms as mere varieties of the one species *I. persica*, we may say that the species has a fairly wide distribution. Stretching from South Persia westward along the more southern parts of Asia Minor, it extends from the extreme east of Persia to the extreme west of Asia Minor. In Armenia and Kurdistan, more especially in their more northern parts, it is accompanied, and eventually replaced, by another *Juno* Iris, which stretches farther north than it does—namely, into the Caucasus—and which, having been first discovered in that country, is called *I. caucasica*.

In the form which was first described, and which we must therefore take as the type, *I. caucasica* is a dwarf plant. From a tuft of four or six shiny, glossy, yellowish-green, ovate-lanceolate leaves, the margin of each of which is armed with a horny ridge, rises a very short stem, often hardly visible, carrying one, two, or three flowers having the *Juno* characters described above, the whole flower being of a dull greenish-yellow. It is a plant

“of botanical interest only,” and well-nigh useless for garden purposes.

The species stretches eastward along the Caucasus and the North of Persia, but when we reach Turkestan we find the typical form replaced by a larger, more vigorous, and really handsome plant, *I. caucasica major*, or *turkestanica*. In this, compared with the type, the foliage is more abundant and ample, the stem more obvious, carrying often as many as five or six flowers, each of which, while resembling the type in general form, is larger, has the lateral expansions of the claw of the fall more developed, and possesses a colour which, though somewhat variable in exact hue, is on the whole a rich yellow. The yellow is deepest on the blade of the fall, the effect being heightened by a conspicuous orange ridge or crest, while the lateral expansions of the claw are pale and usually transparent. The standards are, as in *Juno* Irises in general, insignificant and extended horizontally; the crests of the styles, also yellow, are large and conspicuous. It is a handsome plant, well worthy of cultivation.

I have obtained from Kharput, in Armenia, another variety, which resembles the above in its ample glossy foliage, and in possessing an obvious stem, though this is covered by the decurrent bases of the leaves; it differs in the flower, though large, being more compact, with less prominent, and firmer, lateral expansions of the claw. In form it is exceedingly graceful, but, unfortunately, lacks the golden colour of the Turkestan form, possessing the greenish-yellow of the type. There also exist in Asia Minor other forms, differing in various ways from the type; but none of these appear to be of value for the garden.

The name *I. caucasica* var. *major* has also been given to a plant inhabiting Turkestan, which differs in many respects from the plant which I have just described under that name. This has also been distributed under the name of *I. orchioides* (fig. 22), and since it seems to me to differ from *I. caucasica* by characters of specific value, I propose to retain the latter name. In *I. caucasica turkestanica* (I propose to use this term in order to avoid the confusion attached to the word “major”) the stem, though it exists, reaches at most a few inches in height, and is almost wholly hidden by the bases of the leaves, the internodes being invisible, or nearly so; in *I. orchioides* the stem is often two feet in height, and the nodes are separated by clearly visible

internodes two inches, or even more, in length. In *I. orchioides* the leaves lack the horny margin present in *I. caucasica* and in the variety *turkestanica*; they are also longer and narrower. In *I. orchioides* the individual flowers have a distinct stalk, in *I. caucasica* they are sessile. In *I. caucasica* and its varieties the spathe-valves are inflated, in *orchioides* they are not. In *orchioides* the fall lacks the lateral expansions of the claw so



FIG. 22.—*IRIS ORCHIOIDES*. The side-sketch (A) shows, magnified twice, the standard and its mode of attachment.

conspicuous in *caucasica*, and is long and narrow, spatulate, or even strap-like. The whole flower is smaller and narrower in *orchioides*, but this is compensated for by the rich golden colour of all the parts, the blade of the fall being often marked with black or purple spots. In both *orchioides* and *caucasica* the

fall has a median ridge or crest of a deeper, more orange, colour than its surroundings; but this in the former is somewhat low and simple, whereas in the latter it is large, conspicuous, and often cut up into a fringe of short hairs, simulating the beard of a rhizomatous Iris. The bulb of *orchioides* is very large, sometimes as large as a goose's egg, and the fleshy roots, so generally characteristic of a *Juno* Iris, and well seen in *I. caucasica*,

are frequently ill-developed. Lastly, while *I. caucasica* goes to seed most freely, *I. orchioides*, so far as my experience goes, yields seed most scantily.

Besides this yellow form of *orchioides*, there is also found in Turkestan and Bokhara a plant agreeing with it in all the features of form and habit, differing only in the colour of the flower, which, instead of being uniformly yellow, is of a delicate lavender colour, except some yellow markings over the ridge of the fall and its neighbourhood. This, to my eyes, peculiarly graceful and pleasing Iris has been called *I. caucasica* var. *cærulea*; but, in accordance with what I have stated above, I should prefer to call it *I. orchioides* var. *cærulea*. Another variety, the var. *oculata*, in which the yellow fall is simply dotted with blue, I have not seen alive; nor have I yet seen still another variety, var. *linifolia*, in which the leaves are extremely narrow, linear in fact, the flowers

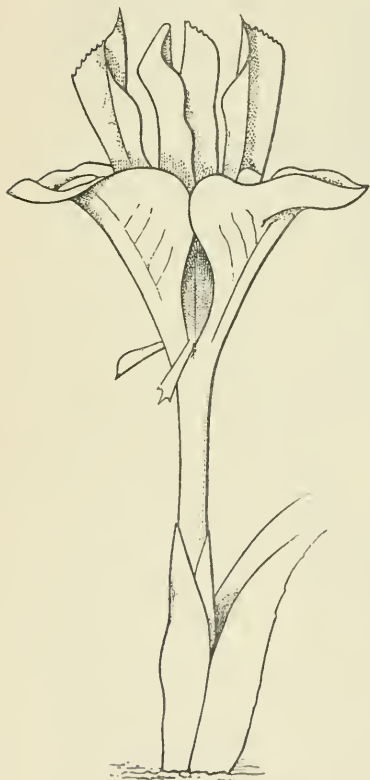


FIG. 23.—IRIS PALESTINA.

being yellow. Still other varieties probably occur in the regions around Turkestan, for the species seems to be exceedingly variable; and though I have not yet come across wild forms distinctly intermediate between *I. caucasica* and *I. orchioides* (I have obtained them by artificial crossing), these may

exist, and all the forms may eventually have to be regarded as varieties of one species.

Unlike the majority of *Juno* Irises, *I. caucasica* and *I. orchoides* present few difficulties in the way of cultivation. Since their foliage does not appear until the severe winter frosts are over, they are quite hardy in the ordinary acceptation of the word. Nor do they need, to the same extent, at least, as many other *Juno* Irises, the "drying-up" in summer. Their leaves do not wither (and this is especially true of *I. orchoides*) until the hot days of summer are upon us, and these seem quite adequate to ripen the bulbs. All that is necessary is to give them a sunny, fairly warm spot, and a soil that is not too light. As far as my experience goes, they flourish best in a rich, somewhat stiff loam, and if I had to choose between clay and sand, I should choose the former.

As I said a little while back, *I. caucasica* spreads from the Caucasus westward into Asia Minor. Here, however, it occurs sparsely; and when we travel further westward and southward we find it replaced by other species of limited range.

In Palestine, for instance, and the Sinai peninsula, the *Juno* group of Irises is represented by *I. Palestina* (fig. 23). This, which is found on Mount Hebron, and on Mount Carmel, in the valley of the Jordan, and elsewhere, is a dwarf little Iris, having all the characters of the *Juno* group, bearing one, two, or three small, greenish-yellow, but variously marked fragrant flowers. It is not very handsome, and, from a garden point of view, not worth the trouble which its cultivation demands. With me the foliage appears in late autumn, and the flowers in mid-winter. No wonder that it is not hardy in this country; I can only keep it alive by growing it in a cool greenhouse.

Still southward of Asia Minor, but to the east of Palestine, in the North of Mesopotamia, and the adjoining Armenian hills, is found *I. sindjarensis* (fig. 24), for the recent introduction of which we have to thank Mr. Max Leichtlin. This presents certain analogies with *I. orchoides*; the bulbs are very large, and the leaves are long, lax, channelled, with their bases clasping the stem, which is a foot or more in height and bears two or three flowers. The general colour of the flower, which exhibits the ordinary *Juno* features, is blue of a somewhat slaty hue, broken by the yellow of the ridge of the fall and by

greenish-blue veins and dots. It does not possess very striking beauty, and yet is graceful ; it has the merit of being distinctly fragrant, the odour reminding one of vanilla.

Like *I. caucasica*, it does not usually "spear" until the winter frosts are over, flowering in March or April. So far as my brief experience goes, it may be considered hardy, and appears to need much the same treatment as *I. caucasica*.

Very closely allied to the above, differing chiefly in that it bears several (eight or ten) flowers, and that these are of a smoky yellowish colour, is the *I. fumosa* growing in North Syria, in the neighbourhood of Aleppo and elsewhere. I can say little about this, since I have not yet flowered it, but imagine that it is of no great value from a gardening point of view.

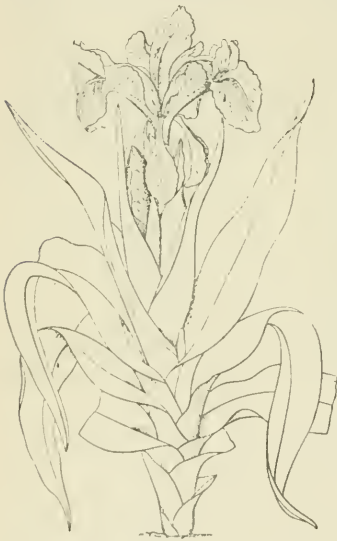


FIG. 24.—*IRIS SINDJARENSIS*
(reduced one half).

As in the west *I. caucasica* and *I. persica* give way in Palestine to *I. Palestina*, so in the east, in South Persia, Beloochistan, and Afghanistan, they are replaced by other *Juno* Irises, more especially by *I. Stocksii*, which in several respects seems analogous to *I. Palestina*, but on which, since it is both difficult of cultivation and not strikingly handsome, I need not dwell. Nor

need I detain you with the details of *I. drepanophylla*, growing in Afghanistan, or of *I. Aitchisoni*, growing in the Punjab, though the yellow form (var. *chrysantha*) of the latter, should it prove amenable to cultivation in this country, since it appears to be a handsome plant, would be a useful addition to our gardens. It has a botanical interest in being the last straggler of the *Juno* group of Irises to the south-east. Probably, however, between this on the east and *I. sindjarensis* on the west, in the zone of South Persia and Beloochistan, there are other, as yet unknown, *Juno* Irises besides the *I. Stocksii* which we know ; and, indeed, it is possible that *I. Stocksii* itself, which has hitherto been

studied from dried specimens only, really represents more than one species.

Let me now turn from these *Juno* Irises of little to one of great garden value. Though *I. caucasica* or *I. orchioides* spreads from Turkestan into Bokhara, there is found also in the latter country a very beautiful Iris, *I. Rosenbachiana* (fig. 25), which is a *Juno* Iris, but lacks some of the characters which I have stated to be distinctive of the group. The fall never possesses the lateral expansions or flanges on the claw which, as we have seen, are so striking in nearly all other *Juno* Irises; it is, in fact, almost strap-shaped; and the standard, though small and spreading horizontally, or even deflexed, is relatively larger than in most other *Juno* Irises. The bulb, too, has characters by which it may be readily recognised; the fleshy roots are numerous but very short, frequently ovoid in form, not long and finger-like as in other *Juno* Irises, so that at a little distance the bulb looks as if it bore at its base a number of smaller whitish bulbs turned the wrong way, pointing downwards instead of upwards. The plant sends up its bloom while the leaves are exceedingly short, almost, indeed, before they have appeared, so that the chief growth of the foliage takes place after blooming is over; and though the one, two, or even three flowers which the bulb throws up are really borne on a stem, this is so short that the flowers appear wholly sessile.

These, however, are botanical features; but the garden value of the plant is due to the colour of the flower, which, in at least a large number of cases, is of striking beauty. I make this qualified statement because the species, though varying little in form and not greatly in size, is exceedingly variable in colour. If I were to adopt the practice common among "florists," and give a separate name to each plant which differed in any way in colour from its fellows, I could, I think, easily make a list of something like a hundred named varieties. In fact, hardly any two plants are exactly alike, and while some are extremely handsome, others are poor, or even ugly. The dominant colour is a combination of purple, yellow, and white; in some the purple is a red-purple passing into a rich crimson, in others the purple is a blue-purple passing into a dull or dingy lavender; and the late Dr. von Regel made two varieties—a red and a blue variety. But the differences, as I have just said, are almost innumerable;

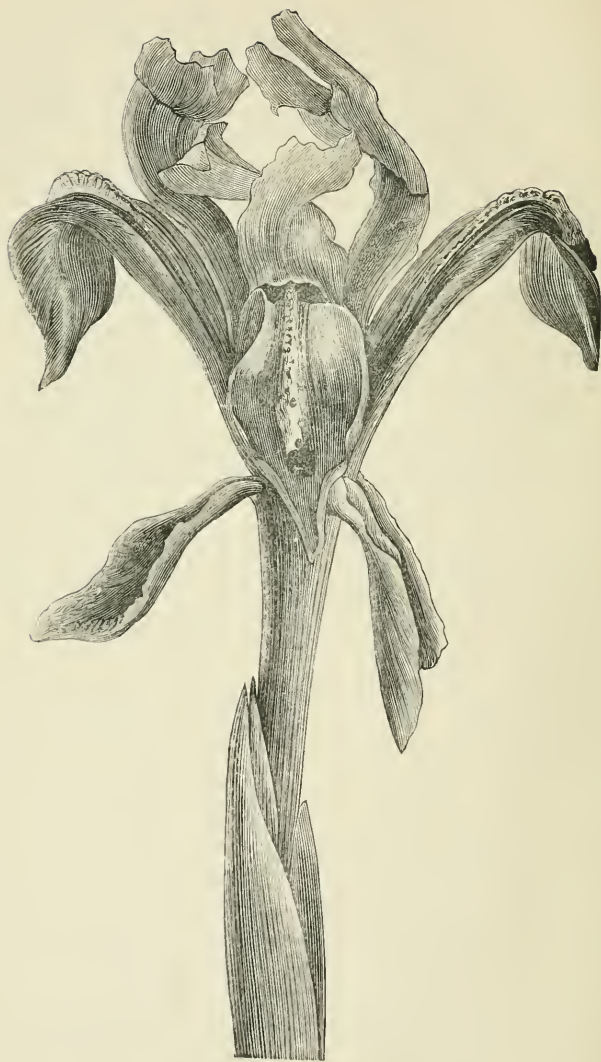


FIG. 25.—IRIS ROSENBACHIANA (CAPARN).

one form, for instance, is nearly a pure yellow, with a few purple or violet markings. In what is, perhaps, the handsomest form, the blade of the claw is a rich deep crimson, except, on the one hand, at the tip and margin, where it is of a pure solid white, and, on the other hand, in the middle, where a large toothed ridge of a rich golden yellow rises up; the standards and the upper surfaces of the styles are of a paler reddish-purple; but the under surfaces of the styles, and the claws of the falls which they overhang, are of a golden hue, broken in the latter case by crimson or purple veins. The combination of deep crimson with bright gold, softened down by white and by several hues of purple and of yellow, is remarkably effective; and the only unfavourable criticism which suggests itself is that the extremely rich colouring of the flower, seen without foliage, or with very scanty foliage, on the bare brown ground on a bleak day in spring, almost passes over from beauty to untimely gaudiness. The same "motiv" in colour may be recognised in the other forms, variations being produced by the relative redness or blueness of the purple, and by the predominance, or otherwise, of the yellow and white. One, to my mind, very beautiful form is of a pure white, except for a large patch of deep violet on the blade of the fall, and some few veins.

The plant flowers in this country in early March, or even in February, according to situation and climate, keeping company with many of the *reticulatas*. It is quite hardy as regards winter frost, the bulbs beneath the ground receiving no injury from the severest English cold, but the ample foliage, the leaves being broad and lax, is apt to be damaged by the later frosts and snow, and by March winds; hence the situation chosen for it should be one which, while fully exposed to the sun, is well sheltered from the wind. In general, the culture needed appears to be about the same as that for *I. caucasica*, save that the plant is not so robust and vigorous as is that species, more imperiously demands to be kept fairly dry in summer, and I am inclined to think prefers a rather lighter, but not too light soil. I feel, however, that I have not as yet learnt all its requirements, for individuals suddenly go wrong and disappear to a much greater extent than is the case with *I. caucasica*. Still I have no reason to doubt that with ordinary care, without special precautions, it can be successfully grown in most places in this country, and I feel sure that,

when the best forms of it become known, it will be exceedingly popular.

I. Rosenbachiana, as I have just said, shows some signs of breaking away from the *Juno* group. Still more divergent is an Iris found in Afghanistan, which was discovered by Dr. Aitchison not far from Pendjeh of sinister notoriety, and which he has done me the honour to name after me—*I. Fosteriana* (fig. 26). This

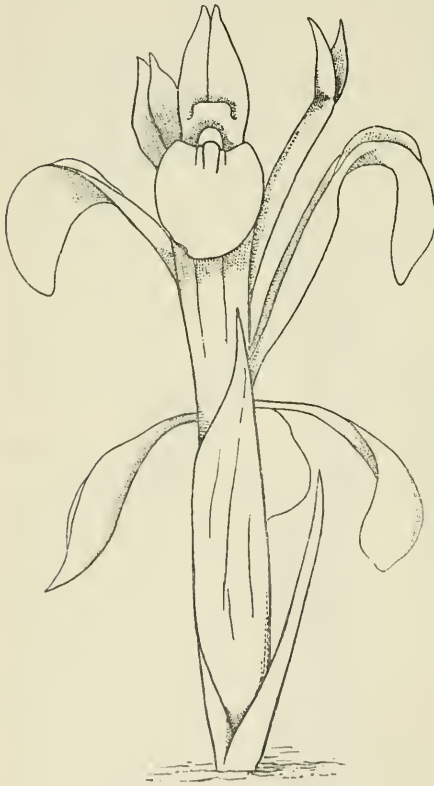


FIG. 26.—IRIS FOSTERIANA.

we may include in the *Juno* group, and yet it shows many affinities with the *Xiphium* group. The leaves are scanty and narrow, almost linear in fact. A stem, a foot or even more high, with clasping leaves, bears one, or sometimes two, flowers. The standards of the flower are, as in *Junos*, not erect, but spread out horizontally, or rather turned downwards; but, unlike other *Junos*, so far from being minute, or even small, they are relatively as large as in the *Xiphium* group. In the fall the claw has no lateral wings, but is narrow, suddenly expanding into a broad blade; and the crests of the styles are of moderate size only. In

all these points *I. Fosteriana* approaches the *Xiphium* group. And in correspondence with these features the bulb (fig. 27) is peculiar; it is thin and slender, covered with several membranous olive-green wrappings, and the fleshy roots so characteristic of the *Juno* group are very feebly developed; they do exist, but

they are thin, and are hardly more than somewhat thickened, more persistent, ordinary annual roots. Thus the plant by its several characteristics is intermediate between the *Xiphium* and the *Juno* groups, being, on the whole, nearer to the latter; if we suppose that it has descended from some ancestor more or less allied to *I. Sisyrinchium*, we may imagine that it has wavered between two lines of development, doubting whether to become a *Xiphium* or a *Juno*.

The flower is not very large, about the size of a small *I. xiphium*, and its chief merit lies in the colouring, though the form is not without grace. While the falls and the styles are yellow, a rich yellow in some specimens, a more or less greenish yellow in others, the turned-down standards are of a full rich purple, and the contrast between these two hues produces an effect which, though the plant bears my name, I think I may say is very pleasing. I have not as yet perceived any fragrance.

It does not take kindly to our English climate. The leaves often begin to spear in late autumn, and suffer from the buffetings of winter; it flowers in March, when its slender stem is laid low by fierce winds, and, judged from the climate of its native home, it needs, what it cannot get with us, the rest of a thorough drought in summer. Not possessing the thick fleshy roots of the other *Junos*, it is less amenable to annual "lifting" than are they; indeed my experience leads me to think that it resents being moved at all. In fact, I find it a very difficult plant to grow, and I doubt if it will ever become common in our gardens. At home, in Gulran, it grows at an altitude of about 4,000 feet, in dry places, in what Dr. Aitchison calls "sandy

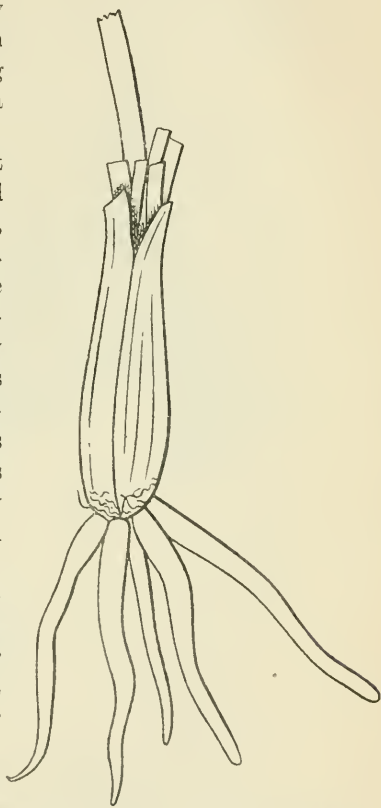


FIG. 27. — BULB OF *IRIS FOSTERIANA*.

clay," and my own experience indicates a moderately stiff, rather than a very light soil, as proper for it. In any case, it should have a spot as dry as possible in winter, and as hot as may be in summer; it must be sheltered from winds, and should be kept free from the encroaching roots of other plants, and especially of shrubs and trees, for if it is to live at all in this country, its struggle for existence must be made as light as possible.

All the *Junos* of which I have so far spoken come, like the wise men, from the East. The centre of their geographical distribution lies in Persia; they disappear further to the east in Afghanistan and in the Punjaub, and to the west they are lost in Asia Minor and in Palestine; the most western representatives are, so far as we know at present, those varieties of *I. persica* which are found in Armenia and Cappadocia. There is, however, a distinctly western member of the group, one only, which flourishes in the extreme west, in Spain, Morocco, and Algiers, and, stretching eastward, is lost in Greece; so far as I know, it has never crossed the Bosphorus eastward, just as no eastern member of the group has crossed the same strait westward. This solitary western *Juno* is the Iris, known long ago to the old gardeners, spoken of by Parkinson as "*Clusius his first great bulbous flower-de-luce*," and called nowadays *I. alata* (fig. 28), *I. scorpioides*, and by various other names. It is fairly abundant in Southern Spain and Portugal, in Algiers and Morocco. It is found in Sicily and Sardinia, and though apparently absent from Southern Italy, reappears, as I have said, in Greece.

It has all the characters of a *Juno* Iris; indeed, the group was founded upon it. The bulb has the distinctive fleshy roots, and the claw of the fall has the characteristic wings; the standards are minute and turned down; the crests of the style are large and prominent, and the leaves are numerous, broad, and lax. The prevailing colour is lilac or blue, the conspicuous, generally fringed or laciniate, ridge on the fall being yellow; but the flower varies very much in tint, and in the prominence of veins of a deeper blue, and of spots or blotches of yellow; and a white albino variety is in cultivation. The flower also varies greatly in size, some flowers, notably the variety "*magna*" and one recently distributed by Mr. Max Leichtlin, being of great size and very beautiful; it is in every way a desirable plant, even the smaller and less highly coloured ones being welcome. It has a



FIG. 23. — IRIS ALATA (Caparn.)

very distinct, indeed powerful odour, which, however, to some persons is not agreeable.

It is distinctly a winter-flowering plant; in this country it sends up its bloom (which is often single, though sometimes two or even more flowers appear) soon after the leaves begin to push in October, or later, according to climate and situation. It makes most of its growth in winter, the foliage beginning to die off in April or May. Hence, in all the northern parts of England at least, it cannot be considered hardy in the absence of protection; the frosts, snow, and winds of winter play havoc with its broad lax leaves, and, left to itself, the plant soon disappears. In the milder southern counties it will thrive, and is there justly appreciated. In my own bleak Eastern Counties garden I find it difficult to grow, even with the protection of a frame, in the absence of artificial heat. But it is a plant which repays some little trouble.

Well-grown and well-ripened bulbs of *I. alata*, potted in summer, plunged in cocoa-nut fibre or ashes until they begin to grow, and brought into a cool greenhouse as soon as the nights threaten to become frosty, will flower freely; but, as a rule, for the first year only. Even when great care is taken to keep them suitably supplied with moisture during and after flowering, and to ripen the bulbs properly by the gradual withholding of water and by full exposure to the sun as soon as their growth is completed, the bloom is uncertain at the second year, and the bulbs soon dwindle. This, at least, is my experience, and I believe that of others; and the result is the same whether the bulbs be left in the pots or be potted afresh year by year. And the same may, I believe, be said of all the *Juno* group; bulbs taken from the open will flower in pots the first year, but rarely beyond that. To keep up a supply in pots for the greenhouse recourse must be had yearly to a stock grown in the open.

When it is desired to increase the stock of a *Juno* Iris, the small bulbs which appear round the base of the larger bulbs may be separated and planted separately, or a mass of bulbs which has arisen from an original bulb may be divided into its several constituents. In doing this care should be taken to preserve as much as possible the fleshy roots; but their preservation, though desirable, is not necessary; bulbs which

have lost all their roots will grow, though they are, of course, handicapped by the loss.

Most of the *Juno* Irises go to seed very freely, especially *I. caucasica*, *I. Rosenbachiana*, and, in an adequately genial climate, *I. alata*; and the seed germinates readily. The seed of the two former, since it does not sprout until spring, may be sown in the open, in prepared beds, and left there for three or four years, at which time the seedlings should be moved when the foliage has gone down, since many of them will by that time have become flowering bulbs. It is, perhaps, hardly necessary to say that when seed is thus sown in the open, it should be covered more deeply, with fine sifted soil, than when it is sown in pots; otherwise much of the seed will come to the surface and be lost. The seed of *I. alata* will, of course, need to be sown under protection, and that of *I. persica* will benefit by a similar treatment.

Iris nepalensis.

With *I. alata* my tale of bulbous Irises comes to an end; and yet I should like to say a word or two about a very peculiar

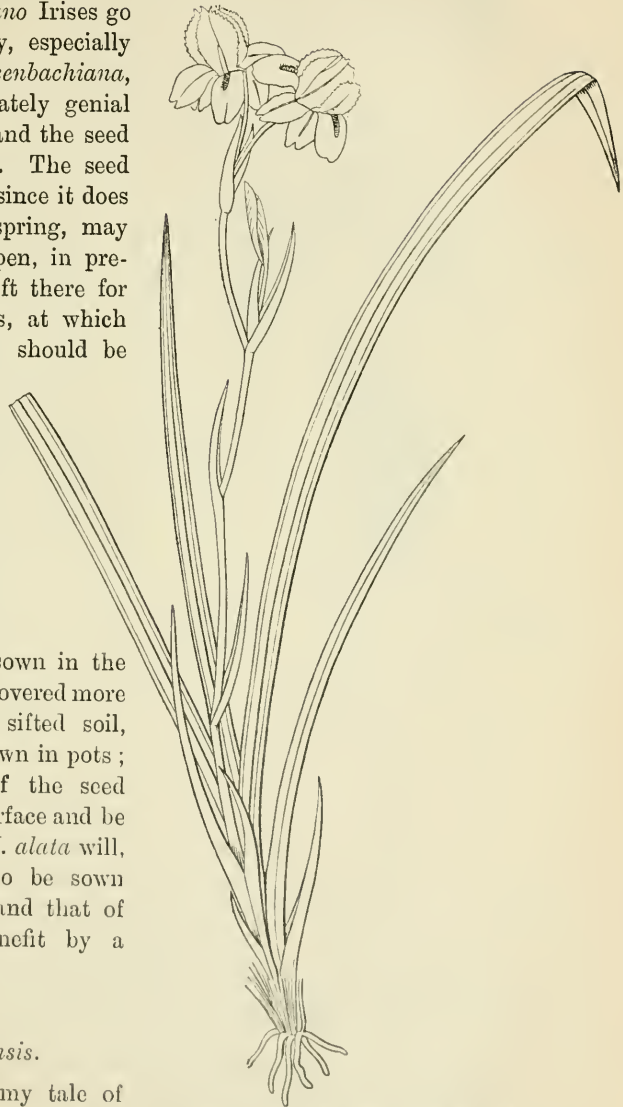


FIG. 29.—*IRIS NEPALENSIS* (reduced one-fourth)

Iris, not a bulbous Iris properly so called, but one, nevertheless, which presents certain striking affinities to the *Juno* group. As I said, the *Juno* group, so far as we know at present, stops eastward at Afghanistan and the Punjab. Still further east,

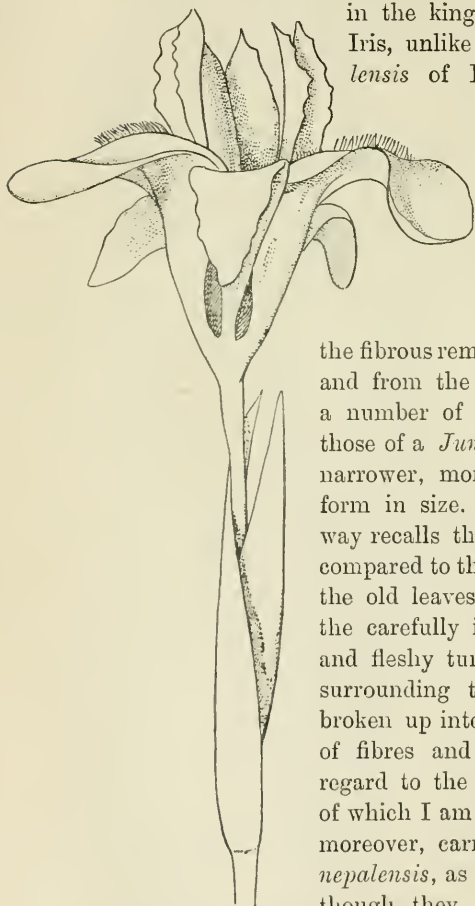
in the kingdom of Nepal, is found an Iris, unlike any other Iris, the *I. nepalensis* of Don (figs. 29 and 30), the

I. decora of Wallich (the *I. nepalensis* of Wallich is quite a different plant, being merely a variety of *I. germanica*). In its resting condition this Iris consists of a small bud, wholly hidden and covered up by

the fibrous remains of the old leaves (fig. 31), and from the base of the bud hang down a number of fleshy roots, very much like those of a *Juno* Iris, only more numerous, narrower, more thonglike, and more uniform in size. The whole root, which in a way recalls that of a *Hemerocallis*, may be compared to that of a *Juno* Iris, the bases of the old leaves of which, instead of forming the carefully inwrapped membranous coats and fleshy tunics which make up the bulb surrounding the central bud, have been broken up into an apparently irregular nest of fibres and bristles. This analogy in regard to the resting root between the Iris of which I am speaking and a *Juno* Iris is, moreover, carried into the flower. In *I. nepalensis*, as in a *Juno* Iris, the standards, though they are not diminished in size, tend to spread horizontally; the fall bears

FIG. 30.—IRIS NEPALENSIS.

a very conspicuous median ridge, toothed or even cut up into a beard, and the crests of the style are largely developed. Moreover, as in most *Juno* Irises, the flower appears while the leaves are as yet young and short. So that, not only in its root but in its flower, *I. nepalensis* comes nearer to a *Juno*



Iris than to any other Iris, and I venture to think that we may probably regard it as an Iris which has descended from the same ancestors as the *Juno* Irises, though it has taken another line of development; its greatest divergence is shown in the stem sometimes being branched.

The flowers of *I. nepalensis*, borne on a stem a foot or so in height, are very pleasing, owing partly to their graceful form and partly to their delicate colour, which is a pale lavender, due to delicate violet veins on a creamy white ground. Unfortunately, the bloom is very fugitive; opening in the morning, it closes and is over before evening; moreover, the plant, in my hands at least, is not very floriferous, and, in addition, needs very special treatment. It has to be supplied with abundant moisture all the summer, and yet to be kept very dry all the winter. The latter end may be gained by lifting the roots in late autumn and storing them until spring in dry sand, treating them in fact like bulbs; but I find that plants so treated are not so vigorous as those which are left in the ground and dried by being covered with lights. To the ordinary gardener the result will not seem worth the trouble, and I do not think that *I. nepalensis* will ever become a favourite. More is to be hoped from a variety of the species found by Lieut.-Col. Stone on the Chin Hills in Upper Burmah, and sent by him to Mr. P. Barr; this I

have ventured to call *I. nepalensis* var. *Letha*. It hardly differs at all from the type, except that the flowers are quite sessile; but it is much more floriferous, and, so far as my short experience goes, much less impatient of the vagaries of our English climate. A plant, of which I simply helped the ripening by covering it with a light in late autumn, stood exposed and unprotected, save for a loose mulching, all last winter (1891-92), and flowered freely at the end of June. The delicate lavender flowers, nestling

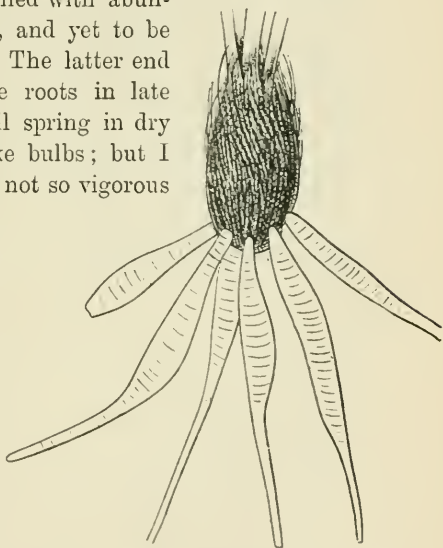


FIG. 31.—RESTING BUD OF IRIS NEPALENSIS.

at the base of a tuft of short green leaves, present a very pleasing sight, and I can well imagine that a mass of the plant would be extremely charming. The flower, moreover, has the merit of being deliciously fragrant. When an adequate stock of the plants has been obtained, it will, I venture to think, become a great favourite.

And now my tale is quite ended. Some of the flowers of which I have spoken are of extreme beauty ; to my mind at least, *I. reticulata* and *I. Rosenbachiana*, in their best forms, presenting two different types of beauty, are surpassed by few other flowers, and many of the others, especially *I. alata*, are very charming. But it is obvious from what I have said that in ordinary gardens these bulbous Irises, with the exception perhaps of *I. xiphium*, *I. xiphioides*, and *I. orchoides*, cannot be grown successfully without special care. They cannot be left alone to take care of themselves ; in the struggle for existence they make, as a rule, but a poor fight. They cannot combat with vigorous perennials, or withstand the inroads of the pushing roots of trees and shrubs. If they are to be grown well, they must have a place for themselves, and in most cases their special wants must be carefully supplied.

LIST OF SPECIES.

In the following pages I give a more formal account of the several species and varieties of bulbous Irises spoken of in the lecture; but the account in each case is intended for gardening rather than for botanical purposes. I give various synonyms, with the respective authorities, since these are often needed by gardeners; but I have not attempted to make the list absolutely complete. I give references to figures, since these are often sought for by gardeners. The descriptions under the heading "Characters" are not intended to be botanical descriptions; I have contented myself with such salient features as will be of help to the gardener. Under the heading "Time" is given the approximate date at which the plant flowers in England. And I have thought that some statement as to the geographical distribution of each kind would be useful and profitable to the gardener.

At the suggestion of the Secretary, I have added a "key" to the several species and varieties. I do this with great diffidence, since it is almost impossible to arrange species in a key under short headings, without bringing into close proximity species which are naturally widely separate; the arrangement selected is almost sure to be artificial, and so far misleading. Moreover, I feel great hesitation in giving a definite position to any plant which I have not had under cultivation; and this, to make the key complete, I have been obliged to do. However, such a key as follows may be useful, and I give it for what it is worth.

KEY.

I.—BULBS WITHOUT SUMMER STORE ROOTS

A.—FLOWERS SESSILE.

			PAGE
1. Leaves linear:			
Outer tunics of bulb membranous	(7) <i>I. Winkleri</i>		64
Outer tunics of bulb netted	(6) <i>I. Kolpakowskyana</i>		63
2. Leaves cylindrical, eight-ribbed	(3) <i>I. Bakeriana</i>		60
3. Leaves four-sided:			
a. Standards minute	(5) <i>I. Danfordiae</i>		61
b. Standards not minute:			
aa. Claw of fall much narrower than blade	(4) <i>I. Vartani</i>		61

<i>bb.</i> Claw of fall nearly as broad as blade	(2) <i>I. reticulata</i>	PAGE 56
Leaves of some height when the flower expands :		
Flowers deep violet	<i>I. ret. type</i>	56
Flowers red-purple, with conspicuous veins on the sides of the claw of the fall	<i>I. ret. v. Krelagrei</i>	57
Flowers bluish, spotted	<i>I. ret. v. Histrio</i>	57
Flowers dwarf, red-purple	<i>I. ret. v. humilis</i>	59
Flowers dwarf, bright blue	<i>I. ret. v. cyanea</i>	6
Leaves very short when the flower expands :		
Segments long and narrow	<i>I. ret. v. sophenensis</i>	58
Segments broad :		
Colour bluish, often spotted	<i>I. ret. v. histrioides</i>	59
Colour red-purple	<i>I. ret. v. purpurea</i>	60

B.—FLOWERS BORNE ON A STEM.

1. Leaves not more than two. Bulb globose, with shaggy coats	(1) <i>I. Sisyrinchium</i>	55
Antthers adherent below, leaves two leaf one	<i>I. Sysyr. type</i>	55
Antthers not or rarely adherent. Flowers much spotted	<i>I. Sysyr. v. monophylla</i>	56
2. Leaves more than two :		
<i>a.</i> Perianth tube absent :		
<i>a.</i> Segments lax and broad	(10) <i>I. xiphioides</i>	67
<i>β.</i> Segments stiff and narrow :		
<i>aa.</i> Fall fiddle-shaped :		
Flowers bluish or white, with segments spread horizontally	(8) <i>I. xiphium</i>	64
Flowers yellow, segments forming a funnel	<i>I. xiph. v. lusitanica</i>	65
<i>bb.</i> Fall not fiddle-shaped :		
Claw of fall nearly as broad as blade	<i>I. xiph. v. Battandieri</i>	65
Claw very narrow	(9) <i>I. serotina</i>	66
<i>b.</i> Perianth tube variable. Fall fiddle-shaped	(11) <i>I. filifolia</i>	68
<i>c.</i> Perianth tube distinct and conspicuous :		
<i>a.</i> Perianth tube not longer than ovary :		
<i>aa.</i> (?) Fall fiddle-shaped	(13) <i>I. Fontanesii</i>	71
<i>bb.</i> Fall with narrow claw and ovate blade	(12) <i>I. tingitana</i>	70
<i>β.</i> Perianth tube much longer than ovary :		
<i>aa.</i> Flower purple, with a slight beard on the fall	(15) <i>I. Boissierii</i>	72
<i>bb.</i> Flower yellow	(14) <i>I. juncea</i>	71

II.—BULBS PROVIDED WITH SUMMER STORE ROOTS.

A.—FALL WITH LATERAL WINGS TO THE CLAW.

- | | PAGE |
|--|--|
| 1. Flowers sessile, that is to say, stem not obvious : | |
| a. Flowers appearing soon after the leaves begin to shoot : | |
| Flower with conspicuous patch on the blade of the fall : | |
| Flower, except for patch, | |
| nearly white (17) <i>I. persica</i> type | 74 |
| Flower purple | <i>I. persica</i> v. <i>purpurea</i> 75 |
| Flower without conspicuous patch | <i>I. persica</i> v. <i>Isaacsoni</i> . 76 |
| b. Flowers not appearing until the leaves have acquired some length : | |
| a. Flowers greenish yellow, | |
| small (20) <i>I. Palestina</i> | 79 |
| β. Flowers blue or purple, large (28) <i>I. alata</i> | 82 |
| 2. Flowers borne on a stem more or less obvious : | |
| a. Leaves with conspicuous horny margin : | |
| a. Flowers purple (23) <i>I. Stocksii</i> | 80 |
| β. Flowers yellow : | |
| Stem hardly visible (18) <i>I. caucasica</i> type. | 77 |
| Stem obvious : | |
| Wings to claw conspicuous <i>I. caucasica</i> v. <i>major (turkestanica)</i> | 77 |
| Wings to claw not conspicuous | <i>I. caucasica</i> v. <i>Kharput</i> 78 |
| b. Leaves without conspicuous horny margin : | |
| a. Leaves broad : | |
| aa. Flowers bluish (21) <i>I. sindjarcensis</i> | 80 |
| bb. Flowers smoky yellow (22) <i>I. fumosa</i> | 80 |
| cc. Flowers wholly yellow (19) <i>I. orchiioides</i> | 78 |
| dd. Flowers yellow and blue | <i>I. orchiioides</i> v. <i>cærulea</i> . 78 |
| ee. Flowers yellow, spotted with blue | <i>I. orchiioides</i> v. <i>oculata</i> 79 |
| β. Leaves very narrow (?) <i>I. orchiioides</i> v. <i>linifolia</i> | 79 |

B.—FALL WITHOUT LATERAL WINGS TO THE CLAW.

- | | |
|---|----|
| 1. Leaves broad. Flowers sessile (26) <i>I. Rosenbachiana</i> | 81 |
| 2. Leaves narrow. Stem obvious : | |
| a. Leaves much arched (25) <i>I. drepanophylla</i> | 81 |
| b. Leaves erect : | |
| a. Standards large (27) <i>I. Fosteriana</i> | 82 |
| β. Standards small (24) <i>I. Aitchisoni</i> | 81 |
| III.—RHIZOME A TUBER (16) <i>I. tuberosa</i> | 73 |

IV.—RHIZOME A BUD covered with bristles, and bearing summer store roots :

- | | |
|--|---|
| Flowers borne on an obvious stem (29) <i>I. nepalensis</i> | 83 |
| Flowers sessile | <i>I. nepalensis</i> v. <i>Letha</i> 84 |

1. **IRIS SISYRINCHIUM.**—Linnaeus, *Sp. Plant.* 59. (From the Greek word *sisyra*, shaggy coat.)

Synonyms.—*I. fugax* (Tenore, *Fl. Nap.* i. p. 15, t. 4). *I. ægyptia* (Delile, *Ann. Sc. Nat.* 1843, ii. p. 237). *I. maricoides* (Regel,

Descr. ix. p. 36). *I. monophylla* (Boissier and Heldreich, *Heb. Norm.* 51). *I. Samaritana* (Heldreich). *Moræa Sisyrinchium* (Ker, *Bot. Mag.* t. 1407). *M. Tenoreana* (Sweet, *Brit. Flow. Gard.* t. 110). *M. sicula* (Todaro, *Hort. Bot. Panorm.* t. 34). *I. juncifolia*, and others. The "Spanish nut" and the "Barbary nut" of Parkinson.

Figures.—Sibthorp and Smith, *Flor. Græca*, t. 42; Redouté, *Lil.* t. 29 and 458; *Bot. Mag.* t. 6096, and as above; Tenore and Sweet, as above.

Characters.—Bulb globose, with shaggy coats. Leaves two, linear, pointed, arched. Stem from a few inches to a foot or more in length, bearing a terminal, and one, two, or more lateral sessile buds, each containing one, two, three, or more flowers. Spathe-valves long, lanceolate, more or less scariose. Upper limit of ovary not sharply defined by any constriction or other outward mark from the perianth tube above. Flower small, lasting when open for a few hours only. Colour varying from light blue to a reddish purple, with variable spots

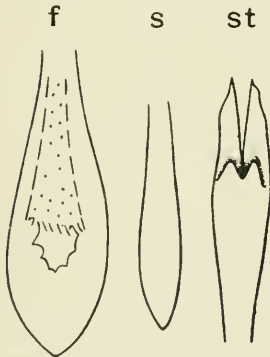


FIG. 32.—*IRIS SISYRINCHIUM*.*

and veins on the blade of the fall, which bears a broad patch (signal) of white, with a median yellow streak, often spotted. Filaments of anthers adherent to the styles and to each other to a variable extent in their lower part. Capsule covered by scarious spathe-valves, rounded-trigonal, long, and narrow, with numerous small oval seeds. Flowers often very fragrant.

Habitat.—Spain, Portugal, Morocco, and thence eastward along both shores of the Mediterranean, Algiers, Italy, Corsica, Sardinia, Sicily, Malta, Tunis, Egypt, Greece and Grecian Islands, Palestine, Syria to Asia Minor, Persia, Beloochistan, Afghanistan, Bokhara, Punjaub.

Time.—Flowers in this country in June.

Varieties.—An albino white variety is sometimes found. The variety *monophylla* (*I. monophylla* of Boissier) from Greece and Egypt has one leaf only, a stem 2 to 4 inches long, often with a terminal bud only, and small dull-coloured flowers. The variety *maricoides* (*I. maricoides* of Regel) from Bokhara has much-spotted flowers, with the anthers for the most part free.

2. I. RETICULATA.—Marschal v. Bieberstein, *Fl. Taur. Cauc.* i. p. 34. (From the netted, reticulate coats of the bulb.)

Fig.—M. v. Bieb. *Cent.* t. 11; Regel, *Gartenflora*, t. 677; *Bot. Mag.* 5577 (not quite typical); *Garden*, vol. xx. (1881), p. 112.

Charact.—Bulb ovoid, with netted coats. Leaf four-sided,

* In this and succeeding figures are given outlines of *f.* fall, *s.* standard, *st.* style, each spread out flat, and of natural size.

armed with a horny point. Leaves and flowers with separate vaginal sheaths. Flower single, sessile, with long tube. Leaves of some length when the flower opens. Spathe-valves green. Fall long, narrow, strap-shaped, with hardly any distinction between claw and blade, of a rich deep violet colour, except that the hind part of the blade bears a low, rounded, bright orange median ridge in the middle of a white patch streaked with violet; the ridge is replaced along the claw by a yellow streak, marked with dots. The median region of the claw on each side of the streak is marked by indistinct veins which are lost at the margin in the uniform violet ground-colour. Ripe capsule long, narrow, pointed at each end, borne up above the ground by a peduncle. Very fragrant, odour of violets.

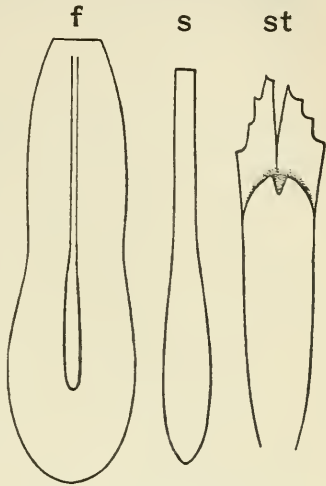


FIG. 33.—*IRIS RETICULATA*.

Time.—March, but variable.

Hab.—Occurs sparsely in the Caucasus and surrounding regions.

I. RETICULATA var. **KRELAGEI**.—Regel, *Gartenflora*, 1873, p. 354. (After Krelage, the Dutch horticulturist.)

Fig.—Loddiges *Bot. Cub.* t. 1829; Sweet, *Brit. Flow. Gard.* 2nd ser. ii. t. 189; Regel, *Gartenflora*, 1873, t. 779, fig. 2.

Charact.—Flower shorter and broader in all its parts, and tube shorter than in the type. Blade of fall generally marked off from claw by a slight constriction. Veins on claw of fall very distinct, separate up to the margin. Prevailing colour a red-purple, varying from dingy plum-colour to deep (almost black) purple. Ripe capsule short, broad, and blunt, half buried in soil. Different plants vary much in size, in the length of the tube, in the relative breadth of the fall, the exact shape of the blade of the fall, which in some is narrower, longer, more pointed than in others, and in the shape and character of edge, whether serrated or not, of the crests of the styles. Sometimes, but rarely, fragrant.

Time.—February or March; variable, but generally somewhat earlier than the type.

Hab.—Common in the Caucasus, and spreading into Persia and Asia Minor.

I. RETICULATA var. **HISTRIO**.—*I. Histrion*, Reichenbach fil. *Bot. Zeit.* 1872, p. 388. (From *histrion*, a stage-player, as if painted for the stage.)

Fig.—*Bot. Mag.* 6033 ; *Garden*, vol. xxxiii. (1888), p. 558.

Charact.—Leaves of considerable length, a foot, or even more, when the flower opens. Tube rather short, and segments somewhat short and broad, as in var. *Krelagei*. Spathe-valves narrow, pointed,

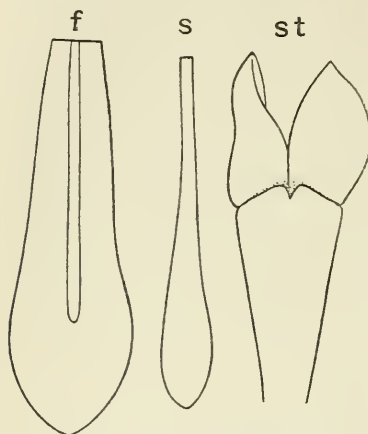


FIG. 34.—*IRIS RETICULATA* var. *HISTRJO*.

nearly colourless and transparent. Style more triangular than in type ; crests of style larger, more triangular and pointed. Differs from the type entirely in colour ; the margin of the blade of the fall is a rich bright colour, which is almost a blue, but has a slight admixture of red ; within this is a region of a creamy white ground with many bright blue blotches and broken veins of a similar colour ; in the median line is a low narrow yellow ridge, which is continued on along the claw as a yellow streak, dotted with low black tubercles. The lateral regions of the claw bear veins which at the base of the claw break up into dots. Standards and styles of a lighter blue, the crests of the styles being marked with deeper veins.

Time.—December to March, according to situation and season ; the earliest *reticulata*.

Hab.—Palestine, Mount Lebanon, Mount Gerizim.

I. RETICULATA var. **SOPHENENSIS**.—Foster, *Gard. Chron.* 1885, i. 470. (From Sophene, the ancient name of the district round Kharput.)

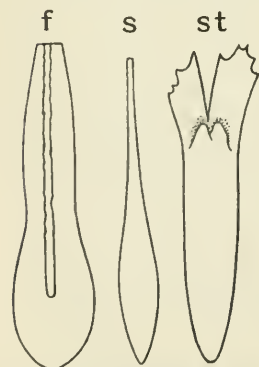


FIG. 35.—*IRIS RETICULATA* var. *SOPHENENSIS*.

Charact.—The flower, with the spathe-valves, appears while the leaves have hardly pierced the ground. Tube variable in length, but always longer than the spathe-valves. Whole flower more spreading, less funnel-shaped than in type. The long, narrow claw of the fall expands into a blade which is only about half as long as, but nearly as broad again as itself. The orange ridge on the blade is continued as a yellow uneven ridge along the whole length of the claw. The colour, which has a peculiar metallic sheen, varies from a dark red-purple to a blue-purple, or to a lilac or lavender. The flower

is not marked with veins except on the claw, and occasionally on the blade of the fall.

Time.—February ; succeeds *Histrio*, and precedes var. *Krelagei*.

Hab.—Asia Minor, near Kharpur, and near Mardin.

I. RETICULATA var. HUMILIS (lowly).

Charact.—Flower appearing while the leaves are a few inches in height. Tube rarely longer than the green spathe-valves, the flower being about two inches high, and more compact than in the other forms. The narrow claw passes, with a slight constriction, into the much broader, ovate-lanceolate blade. The blade of the fall bears a bright orange low ridge, continued along the claw as an orange or yellow streak. Around the ridge on the blade and the streak on the claw is a zone of opaque creamy-white broken up by dots, and by broken veins of dark purple. The rest of the blade is of a full, rich, red-purple colour, on which the veins are hardly visible, contrasting strongly with the creamy-white zone ; at the margin of the claw the veins fuse into a like rich red-purple ground colour. The flower in some respects resembles that of *I. Bakeriana*.

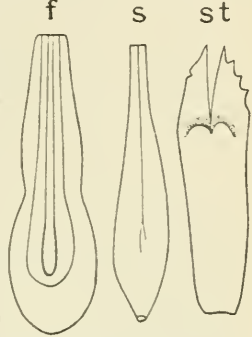


FIG. 36.—*IRIS RETICULATA* var. *HUMILIS*.

The variety cultivated under the name *I. reticulata* var. *cyanea* agrees with the above, save that the colour is a rich cyanic blue and the dots give place to veins ; of this again a pale blue form exists.

Time.—March, between var. *sophenensis* and var. *Krelagei*.

Hab.—Asia Minor, near Van.

I. RETICULATA var. HISTRIOIDES.—(Like *Histrio*.)

Fig.—*Garden*, vol. xlii. (1892), p. 364.

Charact.—The flower appears before the leaves, which are eventually stouter and longer than in any other form of *reticulata*. Flower larger, four or even five inches across, with a tube variable in length, but always longer than the spathe-valves, which are short, broad, blunt, and colourless, or nearly so, being marked by a few green veins. Claw of fall not strap-shaped, but triangular, gradually expanding, a slight constriction, however, marking the transition, into a broad ovate blade as long as or even longer than itself. The falls spread horizontally, so that the whole flower is less funnel-shaped than is the type. Style triangular, short, with large, more or less quadrangular crests. The narrow orange median ridge on the blade is continued along the claw as a ridge, with an uneven tuberculate surface. The prevailing colour is a bright blue, assuming in some specimens a light

violet hue. In some specimens the whole blade and claw outside the ridge is of a uniform blue, broken only by veins of a deeper tint; in

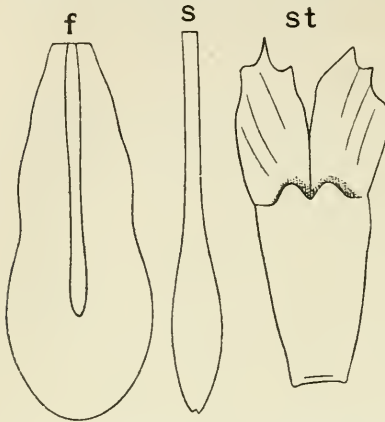


FIG. 37.—*IRIS RETICULATA* var. *HISTRIOIDES*.

others the margin only of the fall is so coloured, and the region between the margin and the median ridge is, as in *Histrio*, of a creamy white broken by irregular dots and blotches of blue and by imperfect veins; and intermediate forms occur. The relatively large standards and styles are of a nearly uniform blue. The ripe capsule, short and blunted, is half, or in some specimens wholly, buried in the soil. In a warm atmosphere the flower is distinctly fragrant.

Time.—March; but variable, sometimes as early as *sophenensis*, sometimes as late as or later than *Krelagei*.

Hab.—Armenia, district of Amasia.

I. RETICULATA var. **PURPUREA**, Max Leichtlin.

Charact.—Leaves two or three inches high, or less, at flowering. Tube short, hardly longer than the spathe-valves. The median ridge of the fall, unlike the case of var. *Krelagei*, continued all along the claw. Colour a fine deep red-purple, especially dark on the blade of the fall. The sides of the claw of a uniform colour, and not broken up into veins as in var. *Krelagei*. The flower is intermediate between *Krelagei* and *sophenensis*. Not distinctly fragrant.

Time.—March, at about the same time as var. *Krelagei*.

Hab.—Asia Minor, neighbourhood of Egin.

I. RETICULATA.—*Varieties arising in cultivation.*

The late Rev. Mr. Nelson raised a form which resembles the type in every way, except that the flower is larger. This is sometimes spoken of as *I. reticulata* var. *major*. He also raised some seedlings of the form of the type, but in which the deep violet is replaced by a slight, somewhat slaty blue; this is sometimes spoken of as *I. reticulata* var. *caerulea*. Mr. Max Leichtlin has since raised seedlings similar in form, of different shades of light blue, one of which is of a very large size.

3. I. BAKERIANA.—Foster, *Bot. Mag.* vol. xlv. No. 539 (Nov. 1889), t. 7084. (After Mr. Baker.)

Fig.—As above. *Garden*, vol. xxxvii. (1890), p. 462.

Charact.—Bulb ovoid, with netted coats. Leaves nearly a foot long at flowering. Leaf armed with horny point, as in *I. reticulata*, but cylindrical, with eight ribs, not four-sided. Flower two to three inches across. Median ridge of fall flattened down, and reduced, so as to be hardly more than a yellow streak. Marginal regions of blade of fall deep violet; central portions creamy white or yellowish, with numerous deep violet spots or blotches. Claw with conspicuous violet veins on the sides, but in the median part more or less yellow, with violet spots. Standards and crests of style bluish lilac. Ripe capsule pointed, thrown up above the soil by the peduncle. Very fragrant.

Time.—February and March; variable, sometimes very early.

Hab.—Armenia, near Mardin. A variety with the parts of the flower more slender, and with an obvious ridge on the fall, occurs near Urmiah, in West Persia.

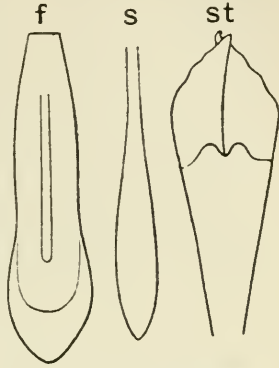


FIG. 38.—*IRIS BAKERIANA*.

4. **I. VARTANI.**—Foster, *Gard. Chron.* 1885, i. 438. (After Dr. Vartan, of Nazareth.)

Fig.—*Bot. Mag.* t. 6942.

Charact.—Bulbs with netted coats. Leaf four-sided, armed with horny point, four inches or more high at flowering time. Flower three or four inches across. Claw of fall very narrow, suddenly expanding into an ovate-lanceolate blade, longer and much broader than itself. Median ridge of fall conspicuous, smooth, and yellow or white on the blade, tuberculate and yellow with black dots on the claw. Crests of style very long, triangular, narrow, pointed. General colour a dull lavender, produced by numerous lavender or violet veins, more or less confluent, on a creamy-white ground. Not fragrant.

Time.—October to December.

Hab.—Palestine, near Nazareth.

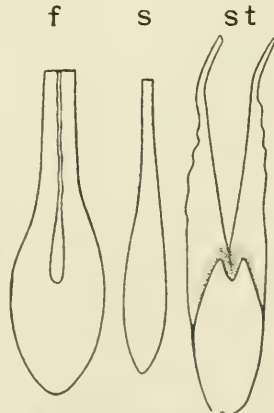


FIG. 39.—*IRIS VARTANI*.

5. **I. DANFORDIÆ.**—Baker, *Journ. of Botany*, 1876, p. 265. (After Mrs. Danford.)

Syn.—*I. Bornmülleri* (Haussknecht, *Flora*, 1889, p. 140).

Fig.—*Bot. Mag.* t. 7140 ; *Garden*, xxxvii. (1890), p. 462 ; *Gartenflora*, 39 (1890), t. 1327.

Charact.—Bulb with netted coat. Leaf four-sided, armed with horny point. The flower, one to two inches across, appears with or even before the leaves. Claw of fall narrow, suddenly expanding into an ovate blade. On the blade is a conspicuous median orange ridge, continued on along the claw. Standard reduced to a mere bristle, invisible at a little distance. Style short, triangular, with large quadrangular crests. Whole flower funnel-shaped, the blade of the fall spreading horizontally, not deflexed. Colour of all the parts a rich yellow, with variable dark brown dots on the blade of the fall near the ridge and along the claw.

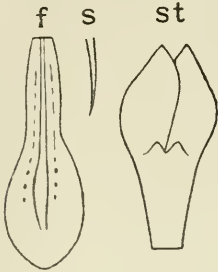


FIG. 40.—IRIS DANFORDIÆ.

Time.—February ; sometimes even earlier.

Hab.—Asia Minor : Cilician Taurus, near Mount Amascha ; Amasia, Egin.

NOTE.—Mr. Baker, in his original description (*loc. ind.*) of *I. Danfordiæ* gathered in the Cilician Taurus, states that the coats of the bulb are membranous. Haussknecht, in his description (*loc. ind.*) of *I. Bornmülleri*, states that the coats are reticulate (*fibroso-reticulatis*), and by this differentiates it from *I. Danfordiæ*. In his "Handbook of Irideæ," Mr. Baker, while making *I. Bornmülleri* a synonym of *Danfordiæ*, describes the coats as "membranous." Not only, however, does Haussknecht insist on the reticulate coats of his *I. Bornmülleri*, but bulbs gathered by Bornmüller, which Mr. Max Leichtlin kindly sent me, so closely resembled bulbs of *reticulata*, that of the same lot of bulbs labelled by so careful a man as Max Leichtlin as "*Bornmülleri*," while most proved to be so by the flower and mode of growth, one or two were real *reticulatas* (I forget the exact variety). Stronger proof of the distinctly reticulated coats of *I. Bornmülleri* could hardly be wanted. On the other hand, I possess, through the great kindness of Mrs. Danford, a dried specimen of the flower of the Iris which she gathered at Amascha ; and I have no doubt as to its identity with the flower of Bornmüller's Iris gathered in Amasia or in Egin (according to Max Leichtlin the Amasia plants differ somewhat from the Egin plants). It is most extremely unlikely that there should be two Irises with the flowers indistinguishable, but one having membranous coats and the other netted coats to the bulb. I am driven to suppose that *I. Danfordiæ* from Amascha and *I. Bornmülleri* from Amasia are really the same plant, and that Mrs. Danford's bulbs had lost their outer netted coats before they came into Mr. Baker's hands ; the inner coats of all the *reticulata* group are much less distinctly

netted than are the outer ones. Mr. Baker's description was confessedly founded on imperfect material; he was thus led to speak of the leaves as terete or subterete, instead of tetragonal. Mr. Baker, who in describing this *Iris* in the *Journal of Botany* (*loc. cit.*) made for it a special group, now (*Irideæ*, p. 44) places it in the *Juno* group, being led to do so by the minute size of the standards. Mere difference in the size of any part of the flower must, judging the matter from a theoretical point of view, be of subordinate importance, of little real weight when opposed to other characters. In all respects save the minute standards, in the bulb, in the leaves, in the flower, and in general habit, *I. Danfordiæ* agrees with the *reticulata* group; in no other respect than the minute standards does it agree with the *Juno* group. I have, therefore, taken it in connection with the *reticulata* group.

6. I. KOLPAKOWSKIANA.—Regel, *Act. Hort. Petrop.* v. 263. (After General Kolpakowsky.)

Fig.—Regel, *Gartenflora*, 1878, t. 939; *Bot. Mag.* t. 6489; *Garden*, xxxiii. (1888), p. 558.

Charact.—Bulb globose, with netted coats, coarser and looser than those of *I. reticulata*. The flower, single, sessile, two inches or so across, appears while the leaves are a few inches high. The flower and its tuft of leaves are invested in one common vaginal sheaf; in *I. reticulata* the flower and each leaf has its own separate sheath. Leaf linear, with each edge thickened into a ridge, thus making the leaf a narrow flattened channel. Claw of fall narrow, long, elliptical, separated by a narrow constriction from the broader, longer, lanceolate blade. The blade bears a low orange median ridge, which becomes a mere streak on the claw. Standards nearly as long and nearly as broad as the fall, with a short claw; the blade a very elongated ellipse. Crests of style triangular, long, narrow and pointed. The styles unite into a column above the tube. Colour of blade of fall a rich red-purple, with deeper veins, the area round the ridge being a creamy white, with broken veins. Claw of fall yellowish, tending to green, with broken purple veins. Standards and styles light purple or lilac. Stigma simple, or at least not distinctly bilid, as it is in all the *reticulata* group. Flowers fragrant.

Time.—March.

Hab.—Turkestan, Karatau Mountains.

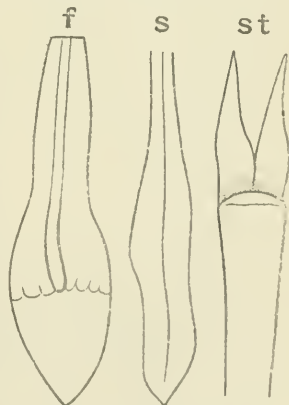


FIG. 41.—*IRIS KOLPAKOWSKIANA*.

7. **I. WINKLERI.**—Regel, *Descr. Pl. Nov.* ix. (1884), p. 37. (After Mr. Winkler, of the St. Petersburg Botanic Garden.)

Charact.—Bulb ovate, with membranous, not netted, coats. Flower single, sessile, with a vaginal sheath common to it and its tuft of leaves. Leaves four to a tuft, linear. Claw of fall triangular, expanding into an elliptical blade. Standards erect and narrow.

Time.—Not in cultivation.

Hab.—West Turkestan, near the river Narju.

8. **I. XIPHIUM.**—Linnæus, *Sp. Pl.* 58. (From *xiphion*, a sword.)

Syn.—*Xiphion vulgare* (Miller, *Dict.* ed. 6). The “*Iris bulbosa angustifolia*” of Parkinson.

Fig.—*Bot. Mag.* t. 656 ; Redouté, *Lil.* t. 337 ; *Garden*, 1881.

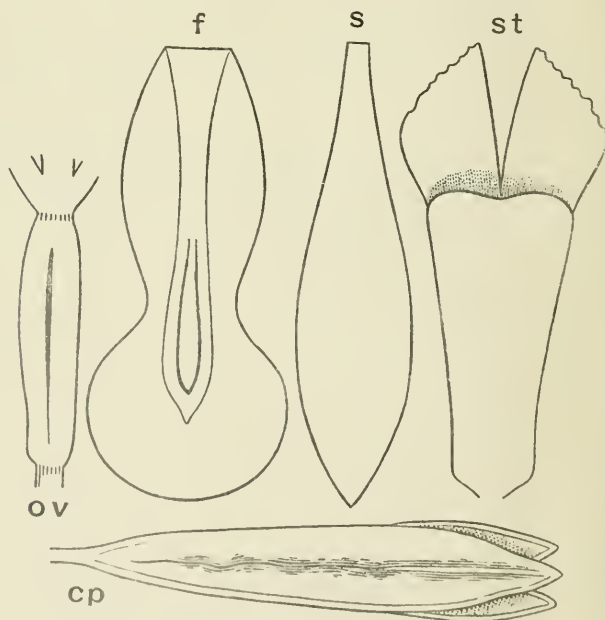


FIG. 42.—*IRIS XIPHIUM* (ov. ovary, cp. capsule).

Charact.—Bulb ovoid, with smooth membranous brown coats. Leaves, frequently shooting in late autumn, awl-like at first, linear when fully grown. Stem two feet or less in height, partly covered by clasping leaves, bearing two flowers. Spathe-valves long, narrow, not much inflated. The flower, four inches or so across, devoid of distinct perianth tube, is borne above the spathe-valves by a long pedicel, the ovary being in consequence often much exserted. Fall

fiddle-shaped, having an orbicular blade, separated by marked constriction from the long claw, which either spreads horizontally or forms, with its fellows, a funnel. Standards narrow, erect. Crests of style large, quadrate. Capsule long, narrow; seed numerous, small, cubical or angular. Colour either a variable hue of purple (with a narrow orange signal on the blade of the fall) or pure yellow, or yellow blotched with purple.

Time.—June.

Hab.—South of France, Spain, Portugal, Algiers, Corsica (?), Sardinia, Riviera.

I. XIPHIMUM var. LUSITANICA.—(After Lusitania, Portugal.)

Syn.—*I. lusitanica* (Gawler), Ker, *Bot. Mag.* t. 679.

Charact.—A form in which the flowers are pure yellow, with an orange signal on the fall, and the perianth more or less distinctly funnel-shaped; the claw of the fall is generally broad, overlapping the style at the sides, and covering in the base of the standard; the ovary is less exerted than in the type, and the spathe-valves have some tendency to be inflated. The *Xiphion sordidum* of Salisbury (*Trans. Hort. Soc.* i. 303) resembles this, save that the flowers are not wholly yellow, but blotched with purple.

NOTE.—The garden form, known as “The Thunderbolt,” is a robust form, with a tall stem, two feet or more in height, and large flowers of a peculiar bronzy or smoky hue, due to an admixture of purple and yellow with brown. Besides its robustness and peculiar colour, one of its most marked features is the breadth of the yellow “signal” on the blade of the fall. This (which, however, is seen, though to a less extent, in some other garden forms) and the fact that it rarely, if ever, in my experience, goes to seed, are perhaps the only indications that it is a hybrid; if it is, the breadth of the signal would indicate *I. filifolia* as one of the parents; and further, if so, *I. xiphium* var. *lusitanica* is probably the seed-bearer, since it is very different from seedlings which I have raised from *I. filifolia* as seed-bearer crossed with *I. xiphium*. Though “The Thunderbolt” shows some of the characters of the *lusitanica* variety, it is wholly different from the plant described by Salisbury (*loc. cit.*) as *Xiphion sordidum*. It may be the *I. spectabilis* of Spach (*Hist. Phan.* xiii. p. 20), which that author suggests to be a hybrid of *I. xiphium* and *xiphioides*; but, if so, Spach’s suggestion is invalid.

I. XIPHIMUM var. BATTANDIERI—(After M. Battandier, of Algiers.)

Syn.—*I. xiphium* (Battandier, *Bull. Soc. Bot. de France*, 1884, p. 366).

Charact.—Bulb, foliage, and general habit same as in type, save that leaves are very glaucous. Perianth very turbinate. Claw of fall not elliptical and separated by marked constriction from rounded

blade, but gradually expanding into ovate blade, there being hardly any constriction between the two. Blade somewhat obovate-emarginate, with very revolute edges. Standards tall, broad, very much twisted. All parts of the flower a pure dead white, except the bright orange ridge on the fall.

Hab.—Algiers, Marais de la Rassanta.

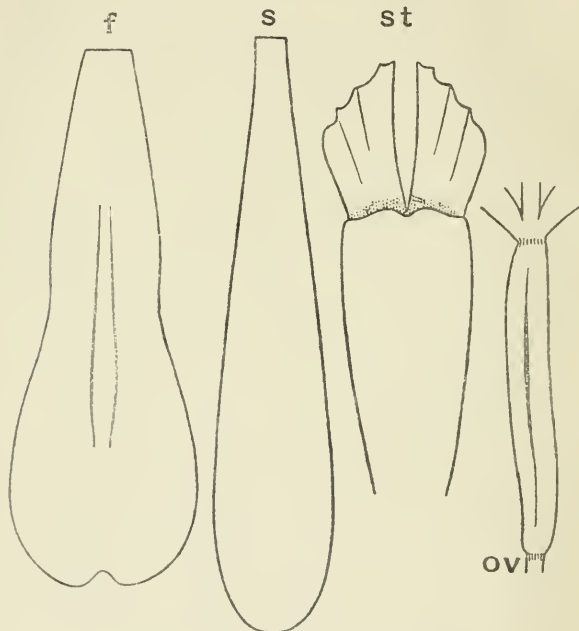


FIG. 43.—*IRIS XIPHIIUM* var. *BATTANDIERI*.

NOTE.—M. Battandier *loc. cit.*) regards this as being truly *I. xiphium*, the above being the only habitat in Algiers; he considers the common *xiphium*-like bulbous *Iris* of Algiers to be *I. Fontanesii*.

A variety of *I. xiphium* gathered by Mr. Maw in the Sierra Nevada of Spain, besides being very slender in foliage, differs from the type in the blade of the fall being relatively large, and having a distinctly crenate edge; the signal, of a bright orange, is also more sharply defined than in the type. The plant, however, hardly deserves a distinct name.

9. *I. SEROTINA*.—Willkomm, *Prodr. Fl. Hisp.* i. p. 141. (From *serotinus*, late.)

Fig.—None.

Charact.—Resembles *I. xiphium*, but appears to differ not only in its very late flowering, but in being less vigorous, with the upper leaves very thin and awl-like, in having reddish spathe-valves, in the flowers being very much protruded from the spathe-valves, and

especially in the fall having an oblong-lanceolate blade and a narrow linear claw. Were the plants found in good condition?

Time.—August or September.

Hab.—Spain, on calcareous mountains near Jaen.

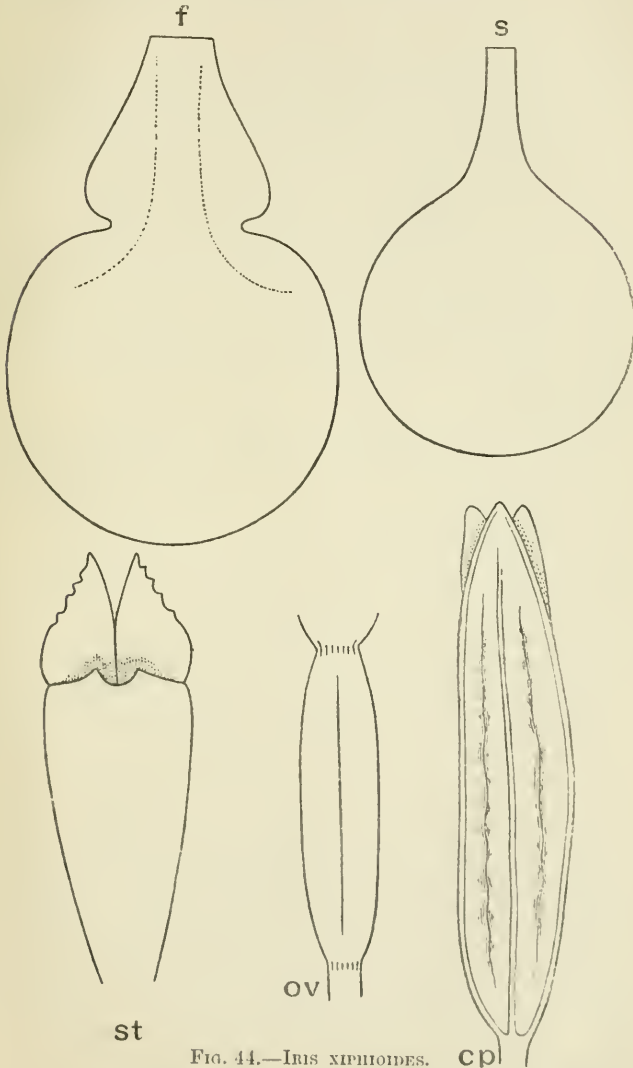


FIG. 44.—IRIS XIPHIODES.

10. I. XIPHIODES.—Ehrhart, *Beiträg.* vii. p. 140. (Like *xiphium*.)

Syn.—*Xiphion latifolium* (Miller, *Dict.* ed. 6). *I. pyrenaica* (Bubani, *Sched. Crit.* p. 3). The “*Iris bulbosa major sive Anglica*” of Parkinson.

Fig.—*Bot. Mag.* t. 687; Redouté, *Lil.* t. 212; *Garden*, xxxi. 1887), p. 212.

Charact.—Bulbs with brown coats, which, when old, tend to become shaggy by splitting up into fibres at the top. Leaves stouter and broader than in *I. xiphium*, not appearing until the spring. The stem bears two, sometimes three flowers. Spathe-valves ventricose. Pedicels short, so that the ovary is not, as frequently in *I. xiphium*, exserted. Blade of fall rounded, with wavy edge, suddenly narrowed to claw, which itself gradually narrows to its attachment. Capsule large, a long pointed oval, with three flattened sides. The seeds, rounded or pyriform, with wrinkled coats, though large, do not fill the cavities of the chambers. Wild specimens are usually of a rich deep blue, with a conspicuous golden signal on the fall. The cultivated varieties range from blue, through various hues of purple, to almost red, and many are variously mottled or blotched. There is also a pure white variety.

Time.—July, succeeding *I. xiphium*.

Hab.—French and Spanish Pyrenees, stretching in the West of Spain as far as Burbia.

11. **I. FILIFOLIA.**—Boissier, *Voy. Esp.* p. 602, t. 170. (From thread-like, filiform leaves.)

Syn.—*Xiphion filifolium* (Klatt, *Linnaea*, xxiv. p. 571). “*Iris bulbosa Africana serpentræ caule.*” “The purple or murrey-coloured bulbous Barbary Flower-de-luce,” Parkinson.

Fig.—*Bot. Mag.* t. 5928, and also t. 5981; Boissier, as above.

Charact.—Bulb like that of *I. xiphium*, except that the outer tunics are more slender, and veined rather than ribbed. Stem from a foot to a foot and a half in height, with foliage like that of *I. xiphium*, but, as a rule, narrower, and in the typical form quite filiform. Flower like that of a turbinate *I. xiphium*, save that sometimes at least a distinct perianth tube of nearly an inch in length is present, that the blade of the fall is more ovate, less rounded, the standard broader, more obovate, with a notched apex, and the whole flower is either of a dark violet or of a rich red-purple, especially full and dark on the blade of the fall, and that the “signal” patch of orange on the blade of the fall is large, and ends broadly and abruptly, not narrowed to a point; in the median line of the patch is a slight raised ridge. The capsule, like that of *I. xiphium*, is long, narrow, rounded, trigonal, with deeply grooved sides, often clavate, and the seeds are small, numerous, and wedge-shaped or angular. The sheaths of the first leaves which pierce the ground are spotted or blotched with purple.

Time.—End of June.

Hab.—Spain, Sierras de Mijas and Bermeja, Gibraltar, Morocco, Algiers.

NOTE.—Boissier, in founding this species on plants gathered by him in the Sierra de Mijas and Sierra Bermeja, insisted on the extremely filiform leaves, a quarter as broad as those of *I. xiphium*, on the possession of a perianth tube half an inch or an inch long, and on the colour (a deep blue-purple) of the flower. In his figure not only does the inch-long perianth tube protrude beyond the spathe-valves, but a considerable part of the ovary is also exerted; and the colour of the flower is a distinctly bluish purple. In the plants gathered at

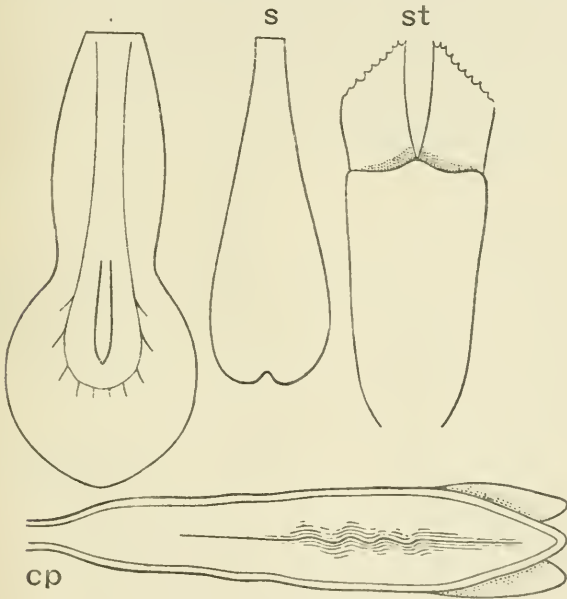


FIG. 45—*IRIS FILIFOLIA*.

Gibraltar which I have cultivated, the leaves, though narrower than those of *I. xiphium*, are much more than a quarter as broad, the ovary is wholly covered by the spathe-valves, the perianth tube is very short ($\frac{1}{4}$ inch), and the colour is a rich reddish-purple. These plants, which correspond very closely to that figured in *Bot. Mag.* t. 5928, approach much nearer to *I. xiphium* than does Boissier's original plant. The plants gathered at Laraisch, about ten miles S. W. of Tangiers, figured in *Bot. Mag.* t. 5981, though there named *I. tingitana*, possess a flower which differs markedly from *I. tingitana*, and is practically identical with that of t. 5928; yet the foliage, so far from being filiform, is exceedingly luxuriant, exceeding in breadth even that of

I. xiphium; so much so that the plant almost deserves the contradictory name *I. filifolia* var. *latifolia*!

We may, perhaps, take up the following position. *I. xiphium*, much as it varies in form, and especially in colour, never possesses a conspicuous perianth tube; though it varies in the exact tint of its blue, never has that blue so much mixed with red as to become a typical purple; has narrow standards, bears a narrow orange "signal" on the fall, and does not vary largely in the breadth of its foliage. *I. filifolia*, on the other hand, varies much as to the breadth of the foliage and as to the length of the perianth tube, has a broad signal on the fall, has broader standards, and is distinctly purple in colour, the exact hue of the purple being sometimes bluish, sometimes reddish.

12. I. TINGITANA.—Boissier and Reuter, *Pugill.* p. 113. (From Tingitana, Morocco.)

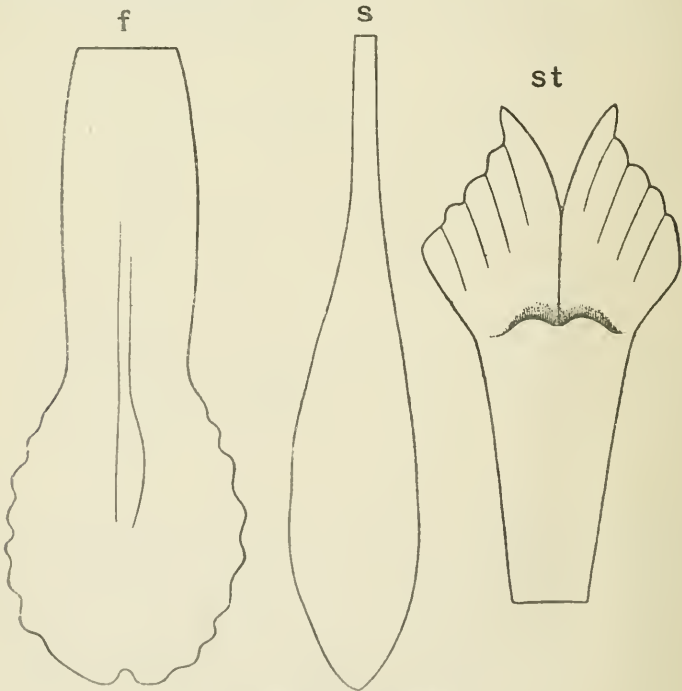


FIG. 46.—IRIS TINGITANA.

Syn.—*Xiphion tingitanum* (Baker, *Seeman's Journ.* 1871, p. 13).

Fig.—*Bot. Mag.* t. 6775; *Garden*, vol. xxxvi. p. 294 (1889).

Charact.—Bulb large, ovoid, pointed; outer tunics thin, reddish

brown, with conspicuous veins. First (vaginal) leaf often red, sometimes spotted. Stem, which bears two flowers, each five or six inches across, about two feet high, completely hidden by the deeply channelled leaves, which are broad, like those of *I. xiphoides*, but very glaucous and striated on the outside. Spathe-valves long, reaching up to flower, somewhat swollen, keeled, pointed, green at flowering; a distinct perianth tube, an inch or more long. Fall, with long claw spreading nearly horizontally, separated by slight constriction from the sharply deflexed, elliptical blade, which has a wavy edge, and is notched at the apex. Standard erect, linear-lanceolate, with wavy edge. Style cuneate, with large, rhomboidal, plaited, and veined crests. Anthers long and large, with orange pollen. Colour of fall light or deep blue, or bluish purple, with deeper veins; the claw bears a very low median yellow ridge, which on the hind part of the blade spreads out into a broad yellow signal. Standards and styles usually deeper in colour than fall, sometimes markedly so.

Time.—March or April.

Hab.—Tangiers.

13. *I. FONTANESII*.—Grenier et Godron, *Fl. de France*, iii. 245. (After Desfontaines, French botanist.)

Charact.—This name was given by Grenier and Godron to the Algerian Iris described by Desfontaines as *I. xiphium*. They describe it as being much larger than *I. xiphium*, and with a more oval blade to the fall. They do not mention—nor, indeed, does Desfontaines—the existence of an obvious perianth tube above the ovary, which is a conspicuous feature of the specimens labelled *Iris Fontanesii* in the Kew Herbarium, and which led Mr. Baker (*Journ. of Bot.* 1871, p. 13) to regard it as identical with *I. tingitana*. Grenier and Godron, moreover, say that *I. Fontanesii* occurs also in Spain; and we may, perhaps, infer that these authors really referred to a large form of *I. xiphium*, as does also, possibly, Battandier (*Bull. Soc. Bot. de Fr.* 1886) when he says that *I. Fontanesii* is very common in Algiers; in fact, Battandier regards what I have just described as *xiphium* var. *Battandieri* as the only true *I. xiphium* growing in Algiers! Whether the specimens from Algiers, having a distinct tube above the ovary, are merely varieties of *I. tingitana*, or whether they represent a distinct species, I should not like to say until I have studied living specimens. I may remark that the existence of a perianth tube above the ovary seems a valid specific character. Though seedlings of *I. xiphium* and *I. xiphoides* have been raised generation after generation, none of them, as far as I have hitherto seen, possess such a tube.

Hab.—Algiers.

14. *I. JUNCEA*.—Desfontaines, *Fl. Atlant.* i. 39, t. 4. (From *juncus*, rush-like leaves.)

Syn.—*I. imberbis* (Poiret, *Voyag.* ii. p. 86). *I. mauritanica* of Clusius, and also of Gawler (Ker), *Bot. Mag.* sub tab. 986.

Fig.—*Bot. Mag.* t. 5890 ; Desfontaines, as above ; *Garden*.

Charact.—Bulb globose, with thick, woody, rigid, reddish-brown, ribbed outer coats, a number of which surround an old bulb and split up into stiff fibres. Leaves very slender, rush-like ; they shoot in late autumn. Stem bears one or, when in good condition, two flowers. Spathe-valves long, lanceolate. Perianth tube one or two inches long, slender. Blade of fall round, or nearly so, much broader than the short, nearly triangular claw, which is curved sideways into a

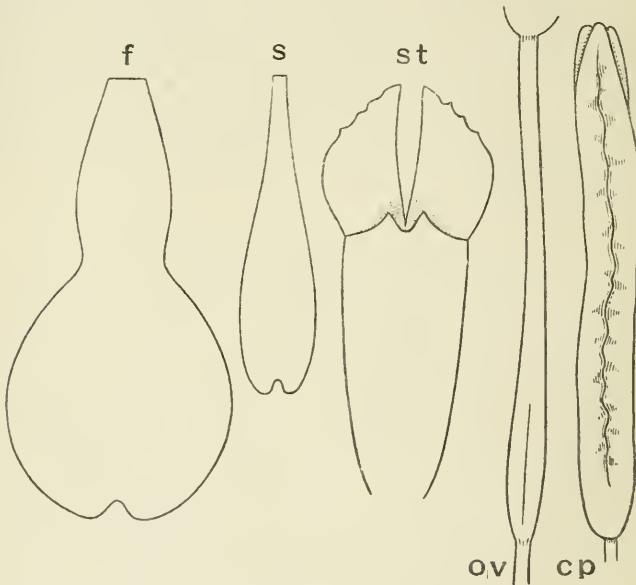


FIG. 47.—*IRIS JUNCEA*.

canal. Standard oblanceolate, shorter than fall. Style triangular, with large quadrate crests raised above the claw of the fall. Colour a rich yellow, a very low ridge on the blade of fall being of a deeper, more orange yellow. Capsule very long, narrow, rounded, trigonal, with deeply grooved sides. Seeds numerous, small, wedge-shaped or cubical.

Time.—June or July, later than *I. siphium*.

Hab.—Algiers, Tunis, Morocco, Sicily, Italy (Riviera).

15. I. BOISSIERI.—Henriquez, *Bolet. da Soc. Brot.* iii. p. 183, with fig. (After Boissier, Swiss botanist.)

Fig.—Willkomm, *Ill. Pl. Hisp.* t. 118 ; *Bot. Mag.* t. 7097 ; Henriquez, as above.

Charact.—Bulb small, with stiff membranous coats. Leaf linear, very channelled, ribbed on outside. Stem about a foot high, almost entirely hidden, except at the top, by three or four clasping leaves, which, filiform and pointed above, are dilated at the base, where they clasp the stem. Flower single, from two to three inches across. Tube nearly two inches long, but almost wholly hidden by the persistently green, somewhat keeled spathe-valves. Fall spreading horizontally or gently arched downwards, so that the perianth does not form a funnel at all. Claw of fall narrow, strap-shaped, suddenly expanding, after a slight constriction, into a rounded oval blade much broader than itself. Standard erect, obovate, relatively broad. Style narrow, lying close down on the claw of the fall, with crests which seem to vary, being sometimes triangular, sometimes very large and quadrate. The blade of the fall a rich red-purple, except in the centre, where is a narrow oval patch of bright orange, continued backwards some way along the claw. On this "signal" patch are a number of thin yellow hairs forming almost a beard, which reaches nearly to the front end of the patch. Standards purple above, reddish below. Styles of a red-purple, the crests being darker and veined. Capsule rounded, trigonal, with deeply grooved sides, an inch or more in length.

Time.—June.

Hab.—Spain, Gercz Mountains.

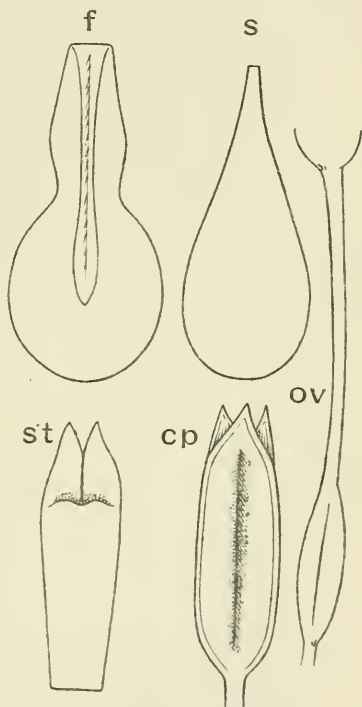


FIG. 48.—IRIS BOISSIERI.

16. I. **TUBEROSA**.—Linn. *Sp. Pl.* 58 ; Thunberg, *Diss.* No. 43. (From tuber-like root.)

Syn.—*Hermodactylus tuberosus* (Salisbury, *Trans. Hort. Soc.* i. 304). The velvet Flower-de-luce of Parkinson.

Fig.—*Bot. Mag.* 531 ; Redouté, *Lil.* t. 48 ; Sibthorp and Smith, *Flor. Græc.* t. 41 ; Sweet, *Brit. Fl. Gard.* 2nd ser. t. 146 ; Reichenbach, *Ic. Fl. Germ.* t. 348, fig. 476 ; *Fl. des Serres*, t. 1083.

Charact.—Rootstock a tuber, which when full-grown is branched. Leaf often very long, four-sided, with a horny point not

so well developed as in *I. reticulata*. Flower about two inches across, funnel-shaped, single, on a stem a foot long. Spathe-valves (sometimes one only is present, sometimes the inner one is entirely hidden within the outer one) long, pointed, swollen, persistent after flowering. Flower with long peduncle and short ($\frac{1}{4}$ -inch to $\frac{1}{2}$ -inch) tube. Fall with an ovate blade, half as long as and generally narrower than the oblong-cuneate claw. Standard minute, narrow, elliptical or lanceolated, folded up sideways, with the apex prolonged into a cusp or awn. Crests of style long, pointed, triangular. The styles are often united at some distance above the tube. The partitions of the ovary

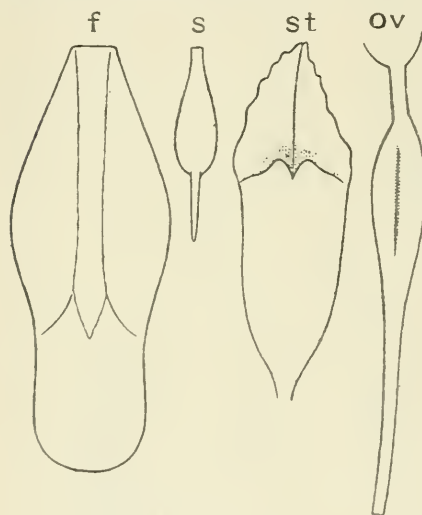


FIG. 49.—*IRIS TUBEROSA*.

do not meet in the middle line, hence the chamber of the ovary is single. Capsule obovate, swollen. The blade of the fall is a deep velvety black, the rest of the flower a yellowish green, with usually a bright green median streak on the claw and beginning of the blade of the fall. The perianth segments are united at their bases, above the perianth tube, into a conspicuous cup.

Specimens from different localities vary a good deal in the length of leaves, as to the presence of a second spathe-valve, as to the exact form of the fall and

of the standard, and to some extent in colouring; some specimen have a reddish tinge on the claw of the fall.

Time.—March or April.

Hab.—South of France, Corsica, Riviera, Sicily, Italy, Algiers and North Africa, Dalmatia, Istria, Greece, Ionian and other Grecian Islands.

Sweet (*Brit. Fl. Gard.* 2nd ser. t. 146) makes three distinct species: *H. longifolius*, the form with very long leaves figured by him, coming from Naples; *H. repens*, with short leaves and a single spathe-valve, figured in Redouté, and Sibthorp and Smith; *H. bispathaceus*, the form with the two spathe-valves, figured in *Bot. Mag.*

17. I. PERSICA. Linn. *Syst.* p. 79. (From Persia, habitat.)

Syn.—*Xiphium persicum* (Miller, *Dict.* 6th ed.). *Iris bulbosa persica* (Parkinson, *Parad.* p. 172).

Fig.—*Bot. Mag.* t. 1; Redouté, *Lil.* t. 189; *Garden*, vol. xxxiii. (1888), p. 558.

Charact.—Bulb ovoid, sometimes as large as a hen's egg, with fleshy radish-like roots. Leaves four to five to a tuft, linear or linear-lanceolate, variable in breadth in fact, but always narrowing to a point, more or less arched, and bent laterally. Flower sessile, two or three inches across, generally single, appearing soon after the leaves begin to shoot. Tube two to three inches in length, but variable. Claw of fall, which bears a median, generally orange, ridge, is abruptly expanded laterally into triangular wings or flanges, which, curving upwards, embrace the style; blade narrower than the winged claw, more or less ovate, always deeply coloured, with a median orange ridge. Standard minute, half an inch long, lanceolate, with toothed or crenate edge, spreading horizontally. Crests of style large, conspicuous, quadrate, with crenate or toothed edge.

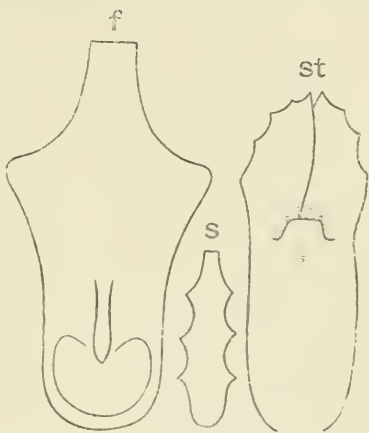


FIG. 50.—IRIS PERSICA.

Varies very much in colour, and also to some extent in form.

Colour of type pale blueish green, almost white, with a deep violet, almost black patch on the blade of the fall, and numerous dark spots on and around the orange ridge.

The var. *purpurea* (Max Leichtlin) is almost wholly dark red-purple, with an orange ridge on the fall, and a deeper tint on the blade of the fall. Other varieties are light purple, almost lavender, yellowish grey, sea-green, &c., but all have a conspicuous patch of deep purple, violet, or even black on the blade of the fall, and an orange or yellow ridge.

Time.—March, but very variable, according to particular situation and season.

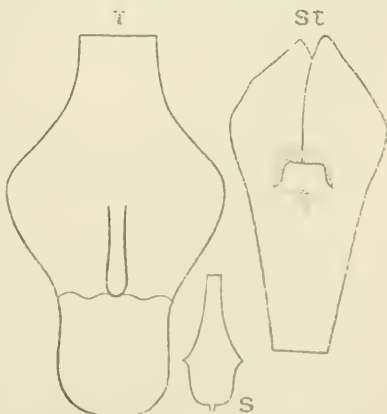


FIG. 51.—IRIS PERSICA VAR. PURPUREA.

Hab.—Persia, and throughout the more southern parts of Eastern and Middle Asia Minor.

I. PERSICA var. **ISAACSONI**.—Var. nov. (After Mr. Isaacson.)

Charact.—Bulb having the ordinary characters of a *Juno* Iris, somewhat elongate, with brown outer tunics. Leaves four to a tuft, each with a colourless sheath, about five inches long and a quarter inch broad at flowering time, but subsequently becoming longer; very pointed; extremely falcate, forming almost a semicircle; extremely channelled and marked, not only with a conspicuous horny margin, but on the outer surface with horny ridges over the parallel veins, giving it a very ribbed and, at the same time, glaucous appearance. Flowers one, two, or possibly more, sessile, among the leaves, each about two inches across; very fragrant. Spathe-valves an inch or more long, very pointed, not ventricose, not keeled, colourless and transparent, except for a few green veins. Tube rather shorter than the spathe-valves, cylindrical, marked with violet longitudinal stripes. Fall having a rhomboidal claw, with conspicuous wings, which, opaque at first, become membranous later; and an ovate-lanceolate-emarginate blade, which is sharply reflexed on the claw. The blade bears at its hinder part a very low, inconspicuous yellow median ridge, hardly deserving the name, continued on the claw as a yellow streak marked with violet dots. The rest of the fall is a creamy white tinged with green, and broken by thick violet veins, which, running parallel to the median streak on the claw, form a conspicuous violet zone around the ridge on the blade. Standard minute, horizontal or turning downwards, lanceolate, with conspicuous teeth, creamy white with greenish tinge. Style creamy white, with a greenish tinge in the median region; much narrower than the fall, somewhat expanded below, with large, quadrate, toothed crests, and a somewhat serrate, horizontal stigma. The three styles are united into a column at some distance above the tube, conspicuous in a side view. Stamens with filament longer than anther, and coarse yellow pollen. Ovary and capsule not seen.

Time.—In its native home in February or March. Cultivated specimens flowered in a greenhouse in October or November.

Hab.—South Persia, Tung-i-Turkan, Kotal Kamarij, Seenah Safid, on dry open spots in *débris* of gypsum; very local, not found above Shiraz.

NOTE.—This Iris is obviously closely allied to *I. persica*, but differs from the type and varieties in the following points: In the extremely falcate character of the leaves and the ribbed feature due to the horny ridges; in the spathe-valves being colourless, transparent, neither ventricose nor keeled; in the lack of development of the median ridge on the fall; and in the absence of any deep patch of colour towards the apex of the blade, which is so marked in the type, and is seen in every variety of *I. persica* so far known to me.

I am indebted for bulbs of this plant to John Isaacson, Esq., of the

Telegraph Department, Bushire. Unhappily, all my plants died before I could fully trace out the history ; those planted in the open started in October, and were killed by the frost in winter, and those grown in pots, after flowering, dwindled away. I have hitherto hesitated to describe it, hoping that fresh plants and further knowledge would enable me to decide whether it should be considered a new species or only a variety of *I. persica*, a point on which I feel in doubt. I have ventured, as the safer plan in the absence of adequate knowledge, to consider it provisionally as a variety of *I. persica*.

18. I. CAUCASICA.—Hoffmann, *Comm. Soc. Phys. Mosc.* i. p. 40 ; Marschal v. Bieberstein, *Fl. Taur. Caus.* i. p. 33. (From Caucasus, habitat.)

Lit.—Baker, *Gard. Chron.* 1876, i. p. 692 ; Maximowicz, *Act. Hort. Petrop.* vi. p. 417 ; *Mélanges Biologiques* (*Bull. Acad. Imp. d. Sci. d. St. Petersb.*), x. (1880) p. 688.

Fig.—Sweet, *Brit. Fl. Gard.* t. 255 ; *Gartenflora*, t. 800 ; Loddiges, *Cabinet*, t. 1506, sub. n. *I. taurica*.

Charact.—Bulb ovoid, with fleshy, radish-like roots. Leaves four to six in distichous tuft, falcate, so as to be nearly horizontal, lanceolate, pointed, ribbed, glaucous, with a conspicuous horny margin. Flowers two to three on a stem, so short that they appear sessile among the young leaves. Flower two to three inches across. Tube short, but rather longer than the inflated green spathe-valves. The claw of the fall, which bears a toothed median ridge, high and conspicuous at the hind part of the blade, lower on the claw, is expanded laterally into wings which are transparent, and which embrace the style. Standards minute, spoon-shaped, spreading horizontally. Crests of style large, quadrate. All parts of the flower a dull greenish yellow, except the median ridge of the fall and its neighbourhood, which is a brighter yellow, marked more or less with violet spots.

Var. MAJOR (TURKES-TANICA).—Larger in all its parts, in foliage and flower. Flowers four or five on a distinct stem, which is, however, wholly hidden by the clasping bases of the leaves. Blade of claw yellow, with

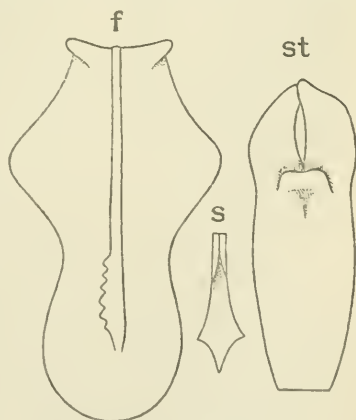


FIG. 52.—*IRIS CAUCASICA MAJOR*.

little or no tinge of green ; median ridge full yellow or orange, toothed, or even fringed, with hair-like processes ; wings of claw very pale and transparent, almost colourless. In other features same as type.

Var. KHARPOT.—Stem a foot or more high, but wholly hidden by the clasping bases of the eight or more distichously arranged leaves, which, six inches or more in length, narrow more gradually towards the point than in the type, and have a less conspicuous horny margin. Flowers five or so, sessile, in the axils of the upper leaves, three inches or so across, of a greenish yellow, except the median orange ridge of the fall. The claw of the fall has hardly any lateral wings, and the blade is large and oval. The standards are larger than in the type, bent vertically downwards, with the edges sharply curled in so as to form a channel. Crests of style large and quadrate. The whole aspect of the plant is very different from both the type and the var. *major*.

Time.—March.

Hab.—The Caucasus, Kurdistan, Armenia, Turkestan. The var. *major* (*turkestanica*) is found in Turkestan; the var. *Kharput* in Armenia, near Kharput.

19. I. ORCHIOIDES.—Carrière, *Rev. Hort.* 1880, p. 337, fig. 68. (After Orchis, “the Orchid-like Iris.”)

Lit.—Baker, *Bot. Mag.* xlv. (April 1890), t. 7111; Foster, *Gard. Chron.* 1889, i. 588.

Syn.—*I. caucasica* var. *major* (Maximowicz, *Act. Hort. Petrop.* vi. p. 417; *Bull. Acad. St. Petersb.* x. (1880) p. 688).

Fig.—Baker; Carrière, as above.

Charact.—Bulb very large, sometimes as large as a goose’s egg; fleshy roots, much less developed than in *I. caucasica*. Stem a foot and a half or two feet, bare in the internodes between the clasping leaves, which are longer, narrower, more gradually pointed towards the apex than in *I. caucasica*, of a more glossy green, especially on the upper surface, with the horny margin much less marked. Flowers from two to three inches across, of a rich, full yellow, generally free from greenish tinge, with a bright orange ridge, and variable dark violet spots, blotches, or lines on the fall. Wings of claw, so conspicuous in *I. caucasica*, almost absent. Spathe-valves green, narrow, clasping the tube, not inflated as in *I. caucasica*.



FIG. 53—IRIS ORCHIOIDES.

Time.—March or April, rather later than *I. caucasica*.

Var.—*I. caucasica* var. *cavrulea* (Regel, *Deser. Pl. Nor.* ix. (1884) p. 37) differs from above only in colour, which is a pale blue or lavender, except that the ridge of the fall and its surroundings are yellow, with lavender blotches; sometimes the whole blade is a creamy yellow.

I. caucasica var. *oculata* of Maximowicz (*op. cit.*) and Regel (*op. cit.*), with yellow flowers, the fall being marked with blue blotches, is probably a variety of this.

I. caucasica var. *linifolia*, Regel (*op. cit.*), with yellow flowers and linear leaves only 3 mm. broad, is also probably a variety of this.

Hab.—Both the type and the above varieties are found in Western Turkestan and in Bokhara.

NOTE.—Having cultivated plants kindly sent to me by the late Dr. v. Regel as *I. caucasica cærulea*, I can speak with certainty as to these having the characters of *I. orchoides*; but not having grown the var. *oculata* or *linifolia*, I cannot be sure whether these hold a like position or no. Maximowicz seems (*op. cit.*) to state that even the type may vary in colour and have a var. *cærulea* (this I have never seen); he also insists that all the characters attributed to the several forms are so mingled in different plants that all must be regarded as belonging to one species.

20. I. PALESTINA.—Baker, *Journ. of Bot.* 1871, p. 108, as *Xiphion Palæstinum*. (From Palestine, habitat.)

Lit.—Boiss. *Fl. Orient.* v. p. 122.

Charact.—Bulb small. Leaves four, six, or eight, in a distichous tuft, smaller and narrower than in *I. caucasica*, striated on the outside, with a finely toothed, horny margin, less conspicuous than in *I. caucasica*. Flowers one to three, apparently sessile—that is to say, borne on a short stem, wholly hidden among the leaves. Flower $1\frac{1}{2}$ to 2 inches across, like that of *I. caucasica*, but with a much longer tube, narrow (not swollen) spathe-valves, and a narrower blade to the fall; the minute standards are toothed, and the rectangular crests of the style very large and conspicuous. Colour usually greenish yellow, the blade of the fall being marked with green, or with blue or violet veins, the amount of blue being variable and sometimes prominent, as in the form named var. *cærulea* by Post. The median ridge of the fall, which is orange in front, bears behind on the claw a number of black or deep violet tubercles, each carrying a tuft of short black or dark purple hairs; a few longer dark hairs are scattered over the claw; the wings of the claw are not transparent. The flower is fragrant.

Time.—December and January.

Hab.—Palestine: Mount Hebron, Mount Carmel, Valley of the Jordan, Sinai Peninsula.

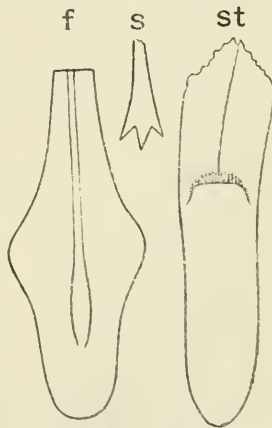


FIG. 54.—*I. PALESTINA*.

21. I. SINDJARENSIS.—Boissier, *Flor. Orient.* v. p. 122. (From Mount Sindjar, habitat.)

Fig.—*Bot. Mag.* t. 7145.

Charact.—Bulb very large, elongate, with fleshy roots. Stem variable in height, sometimes a foot high. Leaves eight or ten, long, and narrowing very gradually to a sharp point, bent into a double channel, very striated on the outside, glossy green on the inside, clasping by their bases the stem so as completely to hide it. Spathe-valves narrow, pointed, as long as the tube. Flowers three or four, two to four inches across. Fall with wings to the claw, a median ridge, and somewhat narrow blade. Standards small, horizontal, or turned down, spoon-shaped, with crenate edge. Crests of style quadrangular, not very large. Blade of fall bluish white, with blue veins. Median ridge and its surroundings yellow, with blue spots, and beginnings of blue veins, which, more abundant on claw, give the latter a blue colour. Standards and styles light blue. The whole flower is blue in the centre, becoming paler at the periphery. Very distinctly fragrant, odour resembling vanilla.

Time.—March.

Hab.—Mesopotamia, near the mountains Sindjar and Gebel Taktak, and adjoining mountains.

22. I. FUMOSA.—Boissier and Haussk. *Sched.* 1865 ; Boissier, *Flor. Orient.* v. p. 123. (From *fumosus*, smoky.)

Syn.—*Iris (Xiphion) Aucheri* (Baker, *Journ. of Bot.* 1871, p. 1010).

Charact.—Differs from *I. sindjarensis* in having shorter and relatively broader leaves, in the stem bearing a larger number, often eight to ten flowers, and in the colour of the flowers, which are greenish yellow, with more or less of a smoky tint ; in many respects resembles *I. orchioides* or *I. caucasica*.

Time.—April.

Hab.—Syria, in neighbourhood of Aleppo.

23. I. STOCKSII.—Baker, *Gard. Chron.* 1876, p. 723. (After Dr. Stocks, Indian botanist.)

Lit.—Boissier, *Fl. Orient.* v. p. 123.

Charact.—Only known from dried plants. Leaves six or eight, narrow, pointed, arched, with white margin. Stem short, bearing one to three flowers, not unlike *I. caucasica*, but lilac or light purple, though apparently varying in colour.

Hab.—Afghanistan, near Quettah ; Beloochistan.

Time.—Not flowered in this country ; probably winter-flowering.

NOTE.—I cannot but think that if the various plants described from dried specimens were brought into cultivation, it would be found that they really represent more than one species.

24. I. AITCHISONI.—Baker, *Journ. of Bot.* xiii. (1875) p. 108, as *Xiphion Aitchisoni*. (After Dr. Aitchison, Indian botanist.)

Lit.—Boissier, *Fl. Orient.* v. 123.

Charact.—Thin linear leaves, a foot or a foot and a half long. Stem a foot or more high, bearing one to three flowers, and two or three bracts. The claw of the fall does not bear wings. Flower purple in the type, but in var. *chrysantha* bright yellow. By its leaves, tall stem, and the absence of wings to the claw of the fall it draws near to the *xiphium* group, but the fleshy roots, and the small spreading standards, mark it as a *Juno*.

Time.—Not cultivated. Flowers in its native home in March.

Hab.—The Punjaub, near Otipore ; Afghanistan.

25. I. DREPANOPHYLLA.—Aitchison and Baker, *Trans. Linn. Soc.* ser. 2, *Bot.* iii. 115. (From *drepane* (Grk.), sickle ; *phyllon* (Grk.), leaf.)

Charact.—Four to six narrow, arched leaves. A short stem, bearing two, three, or more flowers, about two inches across. The fall bright yellow, with the claw devoid of wings.

Time.—Not in cultivation. Flowers in its native home in April.

Hab.—Afghanistan, near Gulran.

26. I. ROSENBACHIANA.—Regel, *Descr. Pl. Nov.* pt. ix. p. 35, tab. viii. (After General Rosenbach.)

Lit.—*Gartenflora*, xxv. (1886) pp. 409, 617, t. 1227 ; Foster, *Gard. Chron.* 1887, i. p. 90, and 1889, i. p. 530 ; Baker, *Bot. Mag.* xvi. (Sept. 1890), tab. 7135.

Fig.—Regel and Baker, as above ; *Garden*, 1888, tab. 653, fig. 2.

Charact.—The bulb has numerous fleshy roots, which are, however, short and ovoid. Leaves lanceolate, not very pointed, eight inches or so long and two broad, five or six to a tuft. Flower sessile, appearing soon after the leaves begin to shoot ; one, two, or three to a tuft. Tube of perianth from two to six or more inches long. Flower variable in size, but often four or even more inches across ; variable also in colour, which is often very vivid, the prevailing hues being red- or blue-purple, and yellow. Fall almost strap-shaped, the blade being not

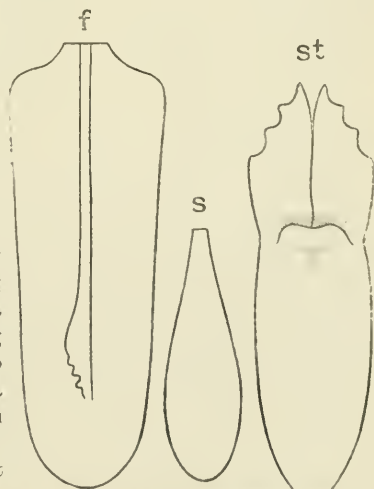


FIG. 55.—IRIS ROSENBACHIANA.

broad, but even narrower, than the claw, with a very conspicuous median toothed ridge, which is generally a bright orange; blade of fall generally vividly coloured. Standard horizontal or drooping, narrow, spoon-shaped, small, but relatively larger than in other *Junos*. Capsule oval, with numerous reddish-brown, wrinkled, more or less cubical seeds, each of which bears a conspicuous white strophiole.

Time.—Flowers in March or April, sometimes in February.

Hab.—Eastern Bokhara.

27. I. FOSTERIANA.—Aitchison and Baker, *Trans. Linn. Soc.* 2nd ser. Bot. iii. 114; *Bot. Mag.* 1892, t. 7215. (After Dr. Foster.)

Fig.—*Bot. Mag.* t. 7215.

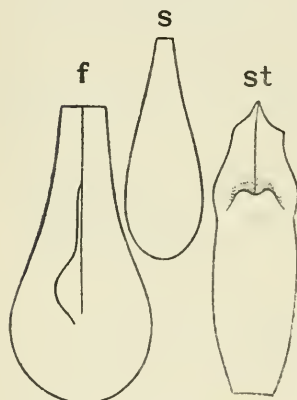


FIG. 56.—*IRIS FOSTERIANA*.

Charact. — Slender, elongate bulbs, with olive-green tunics; fleshy roots, thin and inconspicuous. Leaves linear, not unlike those of *I. xiphium*, but very striated on the outside. A single flower, on a stem about a foot high; sometimes a second lateral flower. Flower about two inches across, with yellow falls and styles, but red-purple standards. Claw of fall narrow, not winged, suddenly expanding into ovate blade. Standard horizontal or deflexed, but relatively large.

Time.—Flowers in March.

Hab.—Afghanistan, near Gulran.

28. I. ALATA.—Poiret, *Voyage en Barbarie*, ii. 86. (From *alata*, winged—the winged claws of fall.)

Syn.—*I. scorpioides* (Desfontaines, *Fl. Atlant.* i. p. 40, t. 6). *I. transtagana* (Brotero, *Fl. Lusit.* i. p. 52). *I. trialata* (Brotero, *Phyt. Lusit.* t. 95). *I. microptera* (Vahl, *Enum.* ii. 142). *Xiphion alatum* (Baker, *Journ. of Bot.* ix. 1871, p. 108). *Thelysia grandiflora* (Salisbury, *Trans. Hort. Soc.* i. 303). *Thelysia alata* (Parlatore, *Fl. Ital.* iii. p. 317). *Costia scorpioides* (Wilkomm, *Prodr. Fl. Hisp.* i. p. 144). *Iris bulbosa latifolia* of Clusius.

Fig.—*Bot. Register*, t. 1876; Redouté, *Lil.* t. 211; *Gartenflora*, 40 (1891), t. 1351; *Bot. Mag.* t. 6352; Brotero and Desfontaines, as above.

Charact.—Bulb ovoid, large, with several brown membranous coats, and fleshy, finger-like roots. Leaves in distichous arrangement, clasping and hiding the short stem, and bent into a channel, large (up to a foot), lax, pointed, arched, pale green. Flower large, sessile, generally one, sometimes two. Spathe-valves lanceolate, somewhat

swollen, pointed, more or less withered at flowering. Blade of fall lanceolate, but claw expanded on each side in rounded, triangular wings, which embrace the style. Standards very small, lanceolate, spathulate, spreading horizontally. Crests of styles very large, deltoid or quadrate, with toothed edge. Capsule oblong, buried among the leaves. Seeds oval.

Hab.—South of Spain, especially near Antiquera and Cordova ;

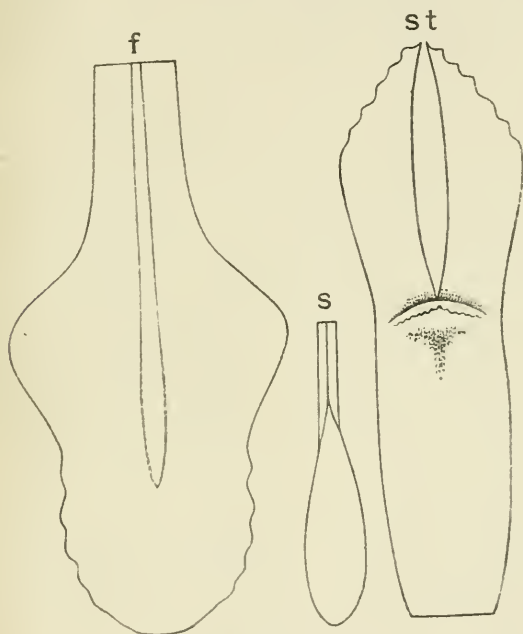


FIG. 57.—IRIS ALATA.

South of Portugal, Monchique Mountains, Algiers, Morocco, Sardinia, Sicily, Greece.

Var.—C. Sprenger (*B. Ort. Firenz.* xiv. 1889, p. 13) describes several varieties, differing chiefly at least in colour and size: var. *speciosa* and *lilacina* from the Atlas Mountains; *nigrescens*, *cinerea*, and *magna* from Sicily, the last from Palermo. A white variety, var. *alba*, is found in Spain and the Atlas Mountains. There is also a var. *cupreata*, the origin of which is unknown.

29. **I. NEPALENSIS.**—Don, *Prodr. Fl. Nepal.* p. 54. (From Nepal, habitat.)

Syn.—*I. decora* (Wallich, *Pl. Asiat. Rar.* i. p. 77, t. 86). See also D. Don, *Trans. Linn. Soc.* xviii. p. 313.

Fig.—In Wallich as above, as *I. decora* ; Sweet, as *I. nepalensis*, in *Brit. Flow. Gard.* 2nd ser. t. 11.

Charact.—Rhizome small, covered and hidden by a nest of fibres, into which the bases of the old leaves split up, bearing in the resting stage a number of white, fleshy, thong-like roots. Leaves linear, ensiform, acuminate, striated, attaining their full growth after flowering. Stem a foot or more, bearing a terminal bud of two to three flowers, and sometimes a lateral bud, or even more than one. Spathe-valves long, pointed, somewhat swollen, persistent. Tube of flower long,

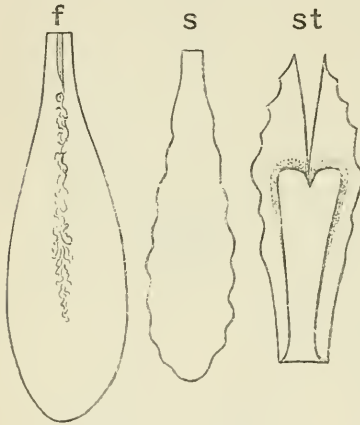


FIG. 58.—*IRIS NEPALENSIS*.

rising above the spathe-valves, and expanding in a funnel-shaped perianth. Blade of lanceolate-spathulate fall spreading horizontally, bearing a median ridge which extends along the claw, and is fringed, or even cut up into irregular hairs. Blade of lanceolate-spathulate standard spreading horizontally, or even drooping, so soon as the flower expands. Crests of style large, deltoid or quadrate, with serrated edge. Stigmatic lip narrow, deeply bilobed. Anther equal in length to filament. Pollen coarse-grained, white. Ovary, with short peduncle, sharply trigonal.

Ripe capsule trigonal, with deeply grooved sides, dehiscing at apex. Seeds oval, sharply pointed at one end, brown at narrow end, but over the greater part of the surface covered by white strophiole. Colour of fall at margin of blade light violet or lavender, in the more median region marked with violet veins on a creamy-white ground, but the median ridge is yellow or orange, with brown dots or blotches ; standard lavender, with fine more deeply coloured veins ; styles lavender.

Hab.—Mountains of Nepaul.

I. NEPALENSIS var. **LETHA**.—Foster, *Gard. Chron.* Oct. 1892, 458. (From Letha Mountains, habitat.)

Charact.—Differs from above in being sessile. Fall with slight constriction between claw and blade. Standard more distinctly lanceolate. Ovary more rounded. Capsule shorter, broader. Seeds more rounded. Foliage shorter, broader.

Hab.—Upper Burmah. Letha Range of Chin Hills.

NOTE.—*Iris nepalensis* is usually—by Mr. Baker, for instance, and

others—included in the *Evansia* section or subgenus, by reason of the conspicuous median ridge (crest) on the fall. As I have elsewhere (*Gard. Chron.* 1887, i. p. 611) urged, though the group *Evansia* seems to me a natural group, I cannot attach any importance to the ridge on the fall. Indeed, in general I may say that the prominence, or want of prominence, of a median ridge on the fall, and whether it is a mere even ridge, or toothed, laciniated, or cut up into a beard, is about the least trustworthy character that can be appealed to in determining the affinities, and so the classification, of Irises. If the presence of a beard is important as a token, *I. Boissieri* ought to go with *I. pumila* or *germanica* in the *Pogoniris* group. If the distinction between a ridge (crest) simply toothed and one made up of hairs (forming a beard) is important, what are we to say to *I. Hookeriana*, in which the median line is occupied behind by a dense beard, and in front by a toothed crest? Indeed, something of the kind is seen often in Irises belonging to the so-called *Pogoniris* section. I cannot place *I. nepalensis* in the *Evansia* group simply on account of the character of the median ridge of the fall, seeing, on the one hand, that this is almost the only character by which it agrees with the other members of the group; and, on the other hand, the same character is almost as prominent in some *Juno* Irises, such as *I. caucasica turkestanica* and *I. alata*. *I. nepalensis* stands almost alone. (I doubt whether it has any real affinity to *I. stolonifera* of Regel, which bears similar fleshy roots, but can say nothing definite, since I have not had this in cultivation.) As I have urged in the text, *I. nepalensis*, by its almost bulbous nature, by its fleshy roots, and by many features of the flower, comes nearer to the *Juno* group than to any other, though it is markedly separated from that group by the stem being sometimes branched, a character which is absent from all *Juno* Irises.

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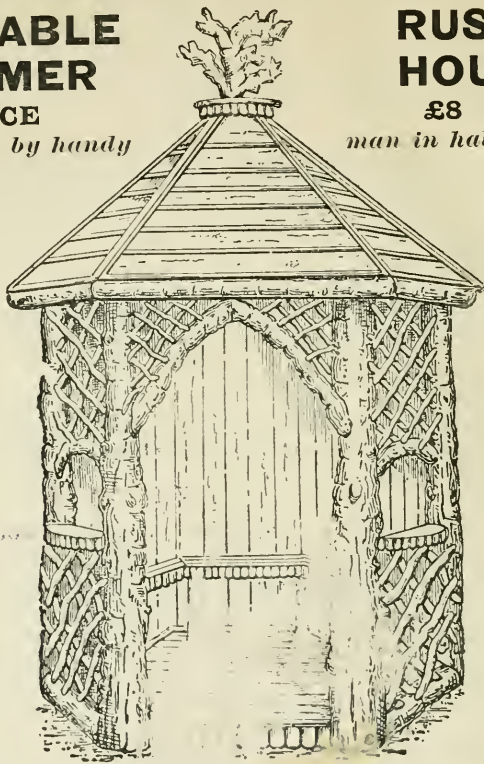
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